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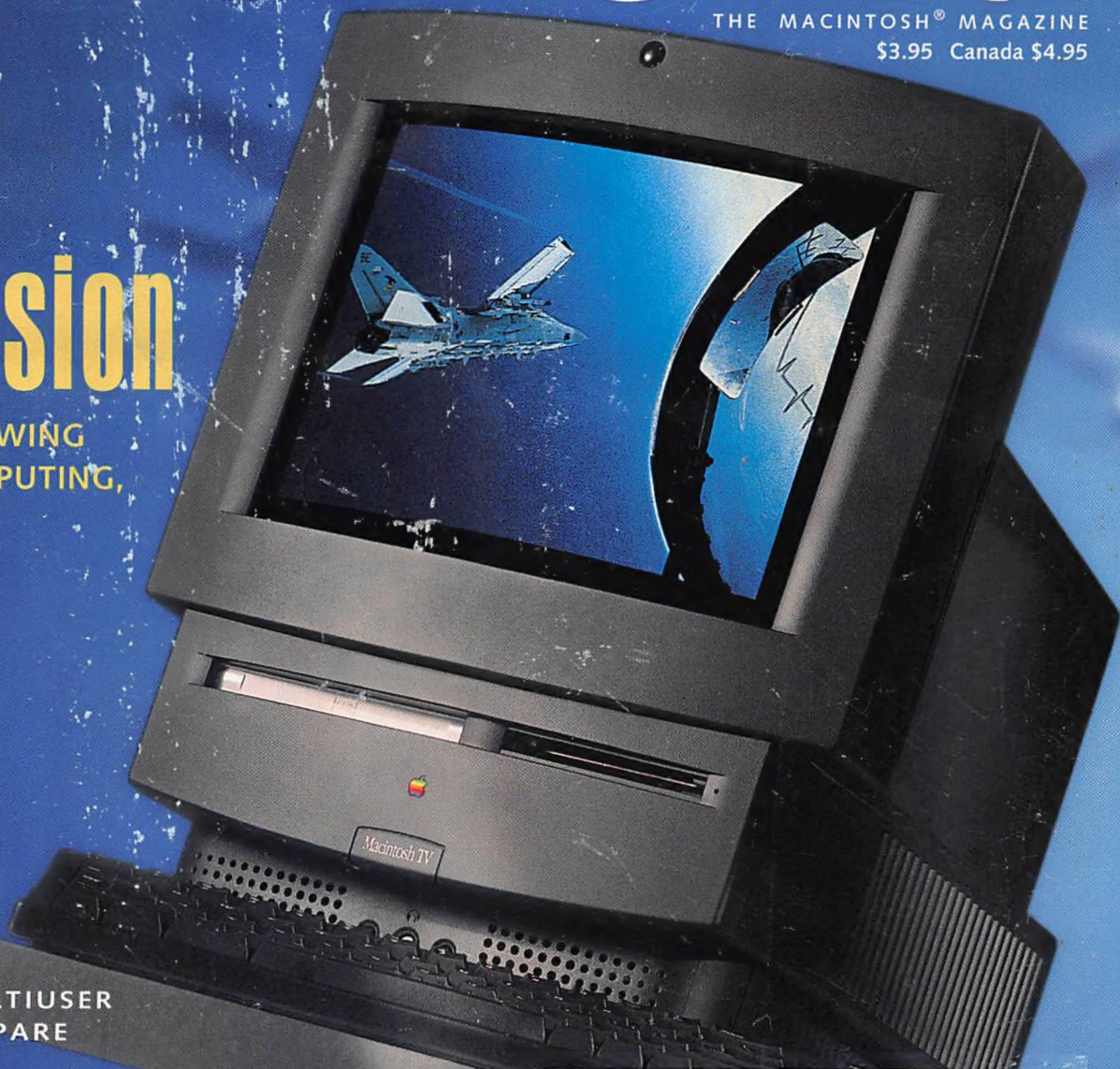
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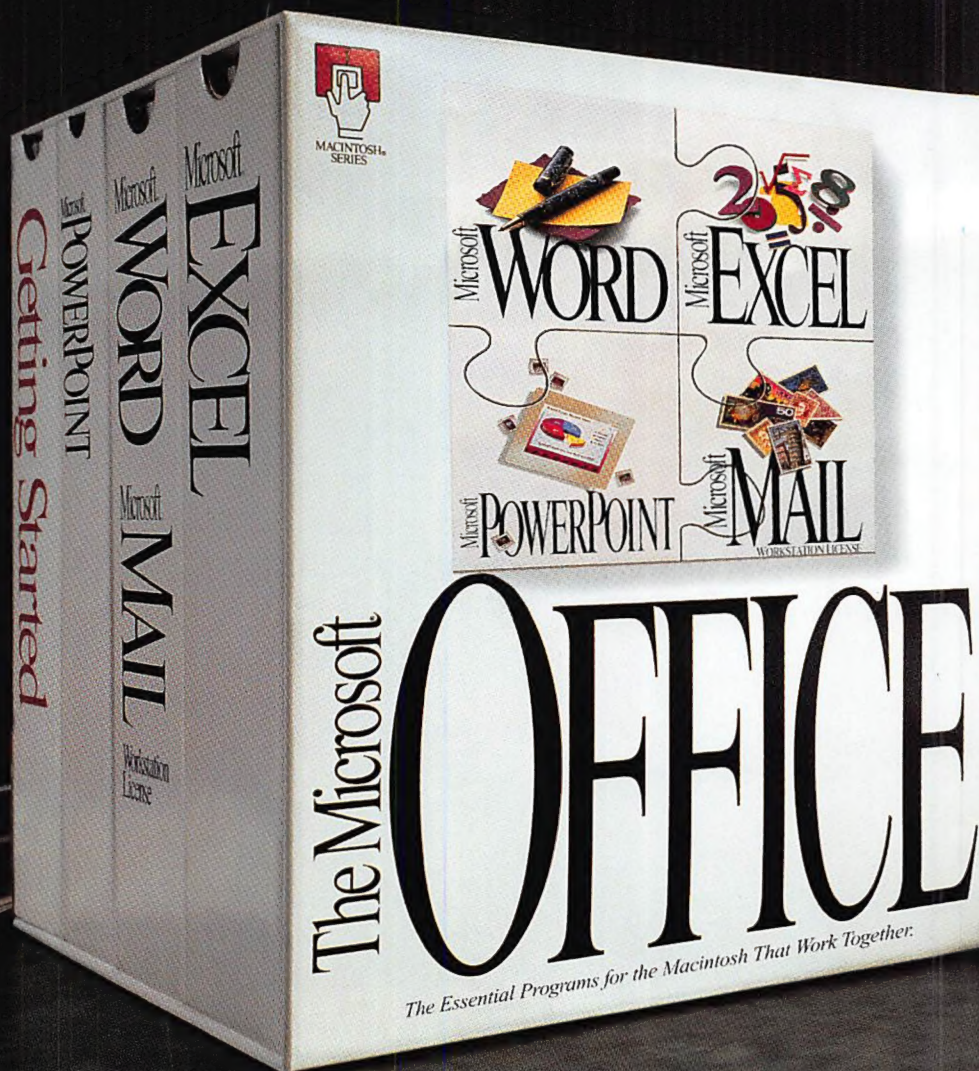
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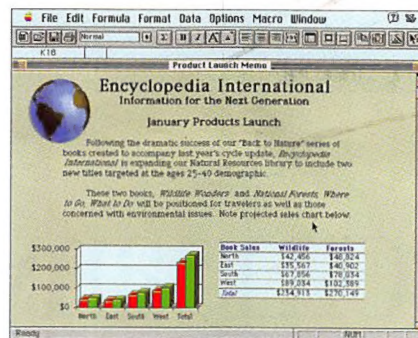
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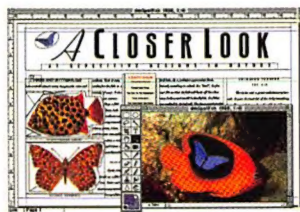
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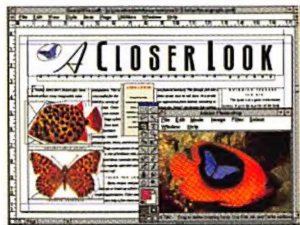
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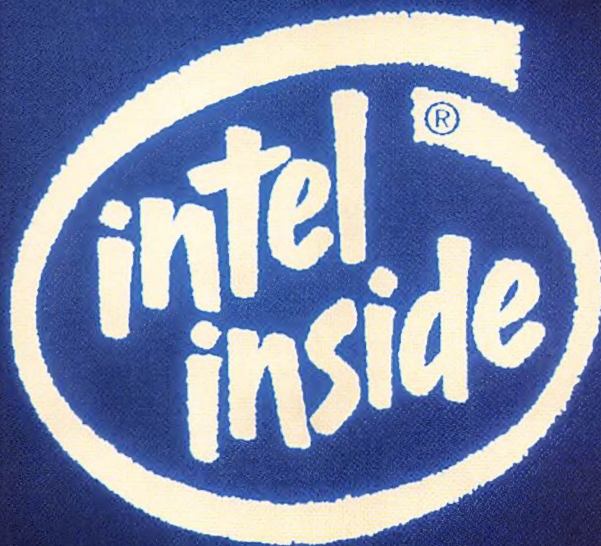
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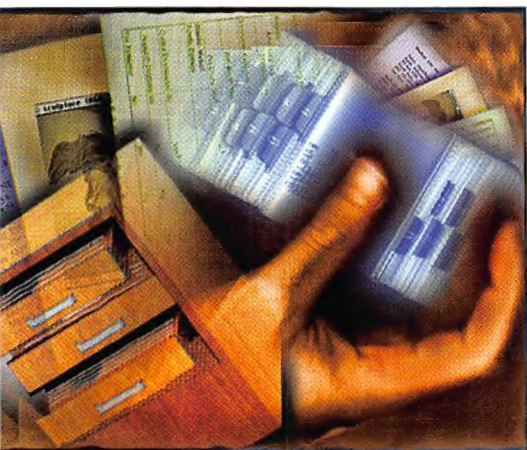
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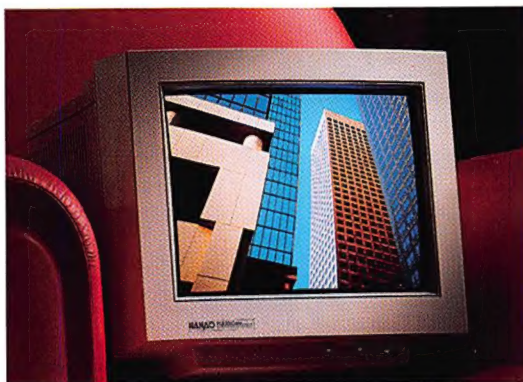
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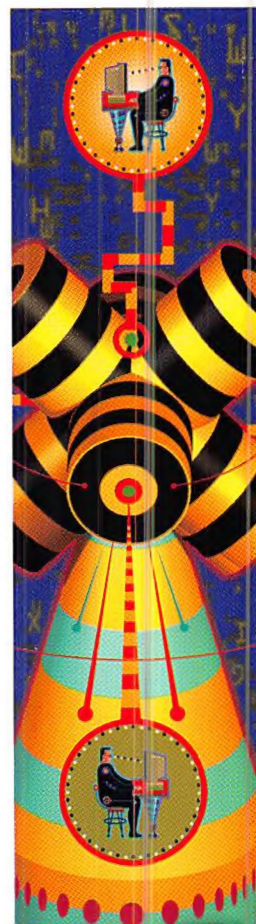
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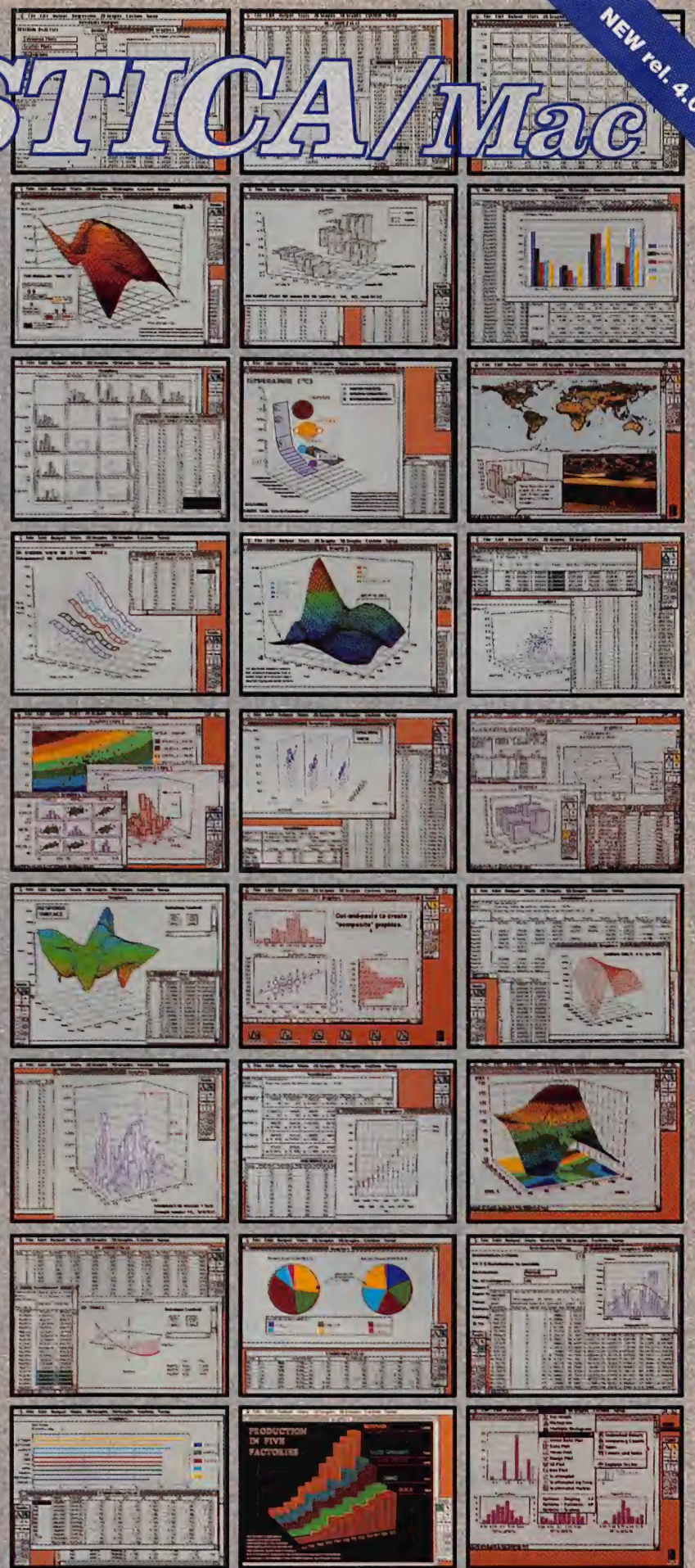


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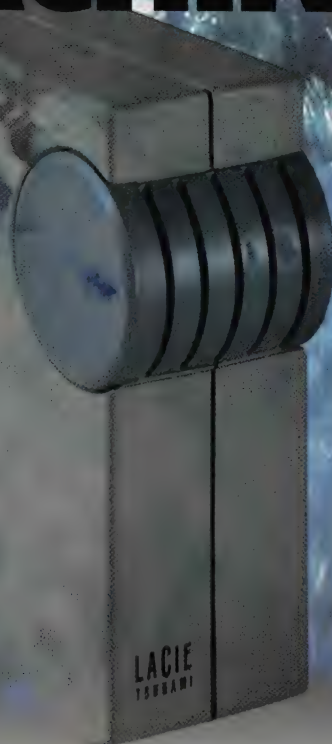
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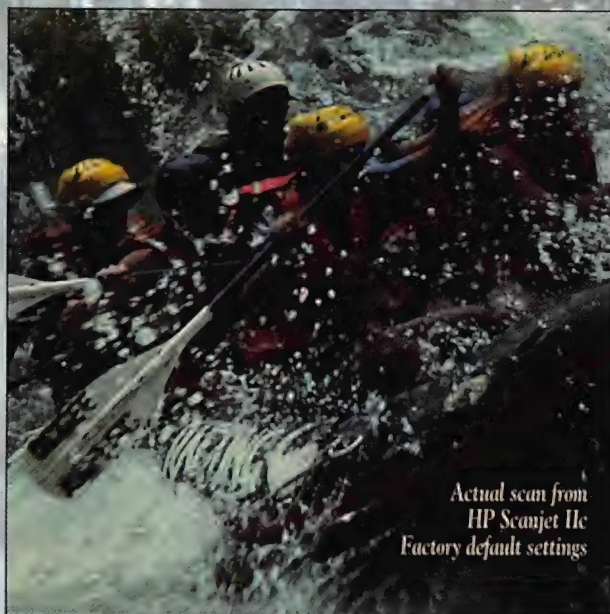
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Choosing a PowerBook

Grading the Mac notebooks

LAST MONTH I LOOKED AT Apple's desktop lineup. Now it's time to check out the revamped PowerBook line. Just like the desktops, PowerBooks are a better value now, and are within the financial reach of more people. There are eight PowerBook models, all of them new except the 180 and the Duo 230, which were introduced a year ago. There are five all-in-one PowerBook models: the 180, 180c, 165, 165c, and 145B. And there are three Duos: the 230, 250, and 270c. As always, the grades I give are my quick takes on the products; they're not meant to be definitive overall ratings. We'll do more thorough reviews after we receive shipping units of the various models.

The big decisions you have to make when choosing a PowerBook are whether you want a black-and-white or color screen, whether you want an all-in-one model or a Duo, and how much money you want to spend.

The PowerBook 165c and 180c

The little *c* in the name of the PowerBook 165c and 180c stands for *color*. It could also stand for *compromise*, because that's what most color notebooks require. First, color uses a lot of power, which keeps you on a fairly short leash when you're operating on batteries. Second, you can get color on most PowerBooks anyway (except for the 145B) by attaching your PowerBook to an external monitor with a video-out cable. This solution isn't portable, and it doesn't let you work in color on an airplane or in a hotel room, but it's fine at your desk, where you are likely to create most of your color documents. The only real advantage to built-in color is being able to view and select color changes to edit presentations en route.

The active matrix LCD screen on the 180c is much preferable to the passive matrix LCD screen on the 165c. The 180c is more expensive and uses a lot of power. These products have received a lukewarm reception in the past because of their high power consumption and high cost, but they are now available at reason-

able prices. I've seen the 165c selling for under \$1800 and the 180c for under \$2800, which means you pay only a small premium for color. Even so, it's hard to be enthusiastic about these products, so I give both the 165c and the 180c a C.

That grade assumes you will make these PowerBooks endurable by purchasing one of the slim battery packs from companies such as Technöggin or VST Power Systems. These products add some weight, but they should be viewed as standard equipment if you plan to work with a color PowerBook for hours instead of minutes without endless battery juggling. Without the extra credit for these battery packs, reduce the grades to a D.

The PowerBook 145B and 165

The lowest-price, all-in-one PowerBook is the 145B. I have seen street prices un-

der \$1300 for this model, about \$400 less than the going price for the PowerBook 165. The advantage of the 165 over the 145B is that the former provides built-in video so that you can attach an external monochrome or color monitor. This is a big advantage if you want to give a presentation. It's also easier on the eyes if you intend to use your PowerBook at your desk for extended periods of time instead of owning two computers. Given these advantages, the 165 provides a lot more

The PowerBook 180

The most compelling monochrome PowerBook is the 180. When this model was introduced a year ago it cost nearly \$4000, but it's now available for less than \$2500. If you are thinking about the 165, look long and hard at the 180. The gray-scale active matrix screen is worth every penny of the price difference. Just ask people who have used a PowerBook with an active matrix screen for a while and then converted to a passive matrix screen.

Usually they wish they had spent the extra money for the better screen. Even though it's a year old and Apple is undoubtedly designing its successor, the 180 is still the most desirable PowerBook for most people. So it earns an A-.

The PowerBook Duos

One of the biggest decisions you have to make is choosing between an all-in-one PowerBook, like those mentioned above, and a PowerBook Duo. The Duos have two advantages. They weigh significantly less than an all-in-one PowerBook, 4.2 pounds

(4.8 pounds for the 270c) instead of 6.8 pounds or so. Also, by combining a Duo with a full-size docking station, you can avoid the inconvenience of transferring files to your desktop system and reattaching and configuring your hardware and network connections. However, not everyone has embraced the Duo concept, and like some skeptics, I was not satisfied with the Duos when they first came out. The lack of built-in features such as a

continues



der \$1300 for this model, about \$400 less than the going price for the PowerBook 165. The advantage of the 165 over the 145B is that the former provides built-in video so that you can attach an external monochrome or color monitor. This is a big advantage if you want to give a presentation. It's also easier on the eyes if you intend to use your PowerBook at your desk for extended periods of time instead of owning two computers. Given these advantages, the 165 provides a lot more

floppy drive and video-out port seemed like a nuisance. Duos offered smaller screens, smaller keyboards, and smaller trackballs; and the only internal modem available was the dubious Express Modem offered by Apple. It also took a while for docking stations to become fully available.

With the latest models, the Duos have started to come of age and I've been converted from skeptic to believer. The newly released 250 and 270c offer active matrix screens with vastly improved screen qual-

ity. The new Duos will also ship with improved batteries, which provide about 25 percent more duration than first-generation Duo Batteries. Several docking solutions from Apple and others are now available, and Global Village Communication (415/390-8200) expects to offer an internal fax modem beginning in January 1994 (see "New PowerBook Duos," *Macworld*, December 1993, for a comparison of docks). You still need to mix and match pieces and live with slightly smaller com-

ponents, but overall the new Duos are appealing machines. Of all the color PowerBooks, the Duo 270c offers the best features combined with reasonable battery capacity, so I give it a B+. Still, I prefer the 250 because it's slightly trimmer, uses less power, and at about \$2500, costs less than the \$3000 270c; but the 250 still offers a beautiful gray-scale active matrix screen. I give it an A, and what's more, it's the model I plan to buy for myself to replace my PowerBook 160.

If you want a PowerBook Duo but you don't want to pay for the 250 or the 270c, consider the Duo 230. It has benefited from Apple's price reductions; you can now purchase a 230 for around \$1500, which includes the external floppy disk drive and floppy adapter. You may also be able to find a good price on the Duo 210 now that it has been discontinued. However, unless you can find it for around \$1000, you will be better off buying a Duo 230 if you want a floppy drive and the 230's superior performance. I also think the Duo 230 is a better deal than the 145B, the all-in-one price leader. For an extra couple hundred dollars, the 230 offers light weight, superior performance, and the potential for video expansion if you add a docking station. The Duo 230 bundle provides the best value for economy buyers, and so it earns a B+.

With the new Duos and price changes, Apple has solidified its PowerBook lineup. The all-in-one PowerBooks are no longer on the cutting edge in features, but they do provide notebook solutions for the Mac at a reasonable price.

Apple's all-in-one models have had the same basic design for nearly two years. It's likely that the design of the next generation of all-in-one PowerBooks is well under way and will continue to add processing power and features in a relatively compact design. The 68040 is the next likely step up in processing power if Apple engineers can work around the demanding power consumption of this processor. Longer term, the low-power-consumption version of the PowerPC processor, the 603 chip, might show up in Mac notebooks as early as late 1994. Beyond improvements in processing power, Apple should consider providing PowerBooks that give a choice of screens, batteries, memory, storage, or other options, much like the NEC UltraLite Versa notebook in the Windows arena.

After looking at all these models, my favorites are the 180 and all the current Duos. The Duos now represent a good competitive value, but the all-in-one PowerBooks need another round of innovation to assure Apple's front-running position in portables. **m**



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Letters

Basic Copper Won't Cut It

YOUR OCTOBER 1993 *NETWORKS* news item "Two Companies Offer FDDI with a Twist" states that two companies, Codenoll and Cabletron, offer FDDI hubs and network interface cards that operate over simple telephone wire. This is not entirely correct.

Simple telephone wire is rated at Level 2, although most installations come up to Level 3—which is the minimum required for Ethernet. FDDI/TP (FDDI over twisted-pair) requires Level 5 twisted-pair wire, which is special and expensive. All the jacks and terminations must also meet Level 5 specifications. Every phase of the installation must be carried out by professionals trained to avoid such installation-related problems as near-end cross talk (interference from near wire pairs). Stating that simple phone wiring or existing Ethernet wiring is sufficient for FDDI/TP may lead your readers to believe that an upgrade to FDDI/TP is cheaper than it really is.

Also, even under the best laboratory conditions, FDDI over twisted-pair rarely makes the 100 Mbps grade, more often topping out at 70 Mbps. This is certainly not the 100 Mbps that fiber-optic cable easily achieves. And fiber has bandwidth to spare for the coming 600-Mbps-plus speeds that ATM (Asynchronous Transfer Mode) will provide. The difference in price between Level 5 twisted-pair and fiber-optic cable is already insignificant. When installation labor and hub and card pricing are factored in, FDDI and FDDI/TP network hardware cost nearly the same.

Matt Strebe
San Diego, California

Fax Letters

WHILE YOUR "HIGH-SPEED FAX Modems" feature (October 1993) rated PSI Integration's tech support as



unacceptable, I have had the opposite experience. I installed a PowerModem III in my PowerBook 180 several months ago, and had difficulty receiving faxes from day one. Even though my extensive travel schedule prevented me from returning many of PSI's timely, persistent phone calls, they sent me several diagnostic programs (at their expense), waited patiently for me to get back to them, and finally, after the modem was determined to be the problem, replaced my equipment, with no questions asked.

Throughout the experience, PSI reacted professionally and provided good troubleshooting assistance.

Gary Baker
via America Online

IT WAS IRONIC THAT YOUR OCTOBER articles "High-Speed Fax Modems" and "The AV Macs" and the *Working Smart* column completely overlooked fax modems with voice capabilities.

There is a far better alternative to buying an AV Mac if you want answering-machine capabilities on your Mac, and that is to buy a fax-modem-voice package. These have been available for well over a year and a half, run on most existing Macs,

and do a very good job, but are consistently underreported in the press. If you already have a Mac and plan to get or replace a fax modem, an additional \$80 or so buys you voice capabilities that will make your average answering machine hide in a corner in shame.

Alain Marcuse
Cambridge, Massachusetts

THE AUTHOR OF YOUR OCTOBER 1993 article "High-Speed Fax Modems," wrote that "The MacProducts USA Magic Fax Modem VFX V.32bis and the entire Zoom Telephonics product family come encased in flimsy plastic, and I wonder whether they'd survive the 3-foot fall from my desk to the floor."

The enclosed fax modem was dropped two stories (about 25 feet) onto asphalt. The case was not damaged by the fall, and the modem is still operating. The status-light lens popped out after the drop, but was easily popped back in.

For your information, our product cases are made from ABS plastic, which is the same impact-resistant material used for telephones.

Frank Manning
President
Zoom Telephonics
Boston, Massachusetts

Macworld's author mixed up his modems when he wrote that comment. In fact, all modems tested for that article appeared sturdily constructed. We regret the error.—Ed.

Guy-Grams

WHOA! MY CAUTION LIGHT popped on when I saw Guy Kawasaki telling Apple to create a computer that will make him throw away his Macintoshes (*Wise Guy*, October 1993). Guy is forgetting the importance of long-term commitment. Here's how that works in the "other" world. OS/2 was supposed

continues

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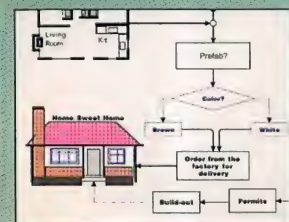


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LETTERS

CORRECTIONS

■ In the October 1993 feature "The Statistical Difference," Minitab should have been listed as retailing for \$695.

■ In November's New Products, Global Village's Teleport/Bronze II should have been listed as shipping with ZTerm and Global Fax.

■ November's cover photo was taken by Stan Musilek.

■ The November MacBulletin story on Iomega ("Iomega Cuts Bernoulli Prices") should have stated that the company increased its warranty on 5¼-inch drives.

■ The November review of Quicken 4 should have listed Intuit's phone number as 415/322-0573.

■ The 800 number listed for Software America (listed as In-House Software in the November feature "Growing a Small Business") is no longer in service. Readers should call 408/649-0576.

■ In the November Networks news, Shana's phone number should have been listed as 403/463-3330.

to be (and probably is) better than DOS, but users and corporate buyers didn't like the idea of throwing away hardware and software, so they stayed with DOS by moving to Windows.

Abandoning platforms scares corporate purchasers. Recommending it to Apple doesn't help Mac believers like myself sell our favorite machine within a business environment.

Larry Gauper
Fargo, North Dakota

ALTHOUGH I AGREE WITH GUY Kawasaki that Apple should reduce the number of Macintosh models, spin off Claris, and kill Mac software application projects inside Apple, I don't agree with his business practices.

If he thinks that putting Apple's stock price in the toilet is going to help the company excel in the unsure 1990s, he need only look to Armonk, New York, to see the benefits of such a move.

L. J. Launer
Saint Charles, Missouri

IDON'T KNOW WHAT'S BIGGER these days: Apple's product line or Guy Kawasaki's ego.

I'm sure that no one in the world understands Apple better than Guy. Thank God (or should that be Guy?) that he has written *The Macintosh Way*. If you are using a Mac right now, stop what you are doing, turn the thing off, and run out and get Mr. Kawasaki's book. Don't you dare

start using your Mac until you've read it, cover to cover, and have it committed to memory.

Jim Jagielski
Greenbelt, Maryland

Shareware versus Crippeware

WHILE I AM HAPPY TO SEE AN ARTICLE describing shareware software in a positive light, I thought David Pogue's column was misleading in one important way—it gave the impression that almost all shareware runs in a kind of limited "demo mode" until you pay the fee (*The Desktop Critic*, October 1993). He said, "Test-drive the '94 Civic for two weeks—if you send in your check, Honda sends you the brake pedal."

Most shareware is fully functional right from the start—what he is describing is so-called crippleware, which is a small minority of the good shareware programs. Many (or perhaps most) shareware programs will put up a splash screen reminding you to pay, until you enter the registration code, but that is not crippling the program, it is just a perfectly reasonable reminder.

Stuart Cheshire
Stanford, California

High-Tech Stick-in-the-Mud?

CARY LU SAYS AT THE END OF YOUR article on the Apple Newton ("A Small Revelation," September 1993), "Handwriting recognition in an intelligent assistant is a vital step toward making machines conform to human needs, standards, and styles, rather than the other way around."

That's fine for some people, but I've grown up typing things into computers, and if I have the choice of writing by hand or typing on a keyboard, I'll choose a keyboard every time. One of the reasons I have a computer is that I hate to write longhand—I can type much faster.

Who knows, in ten years I might still be typing thank-you notes on my LC II while the rest of the world uses a Newton with a stylus. I will not be taken!

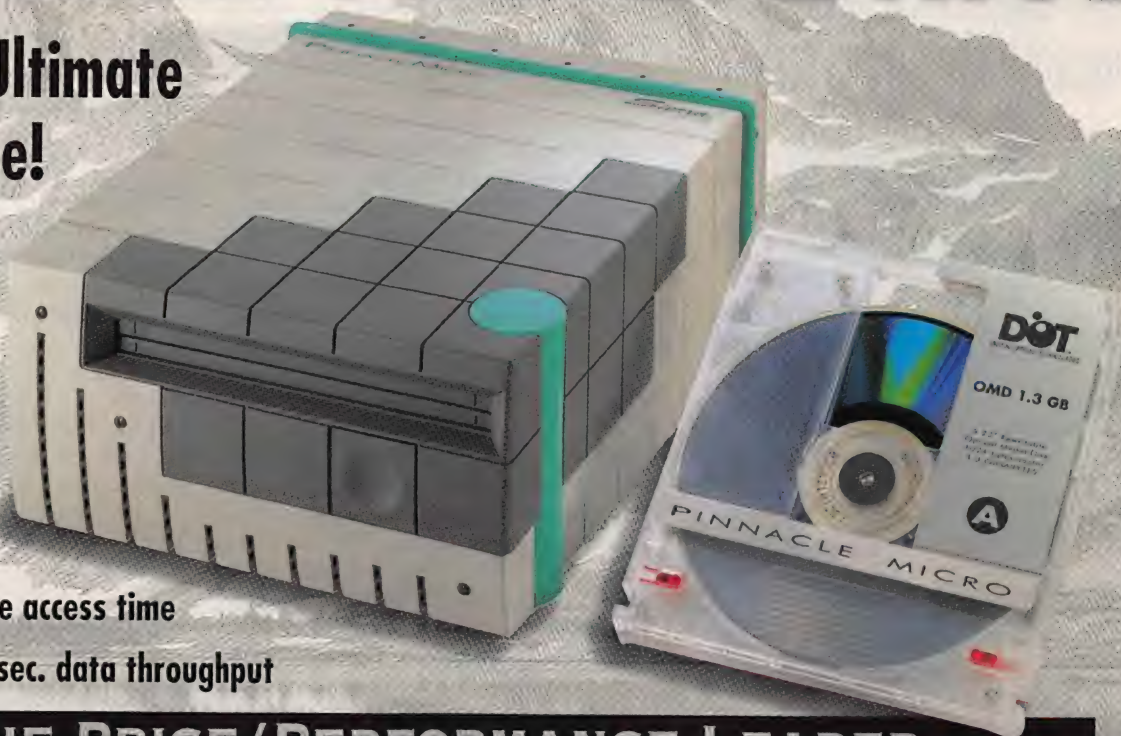
Marty Miller
Minneapolis, Minnesota

Switch Box Needed

JOSEPH SCHORR'S ARTICLE "MAXIMIZE Your Printer" (September 1993) was very timely for my husband (the DOS-Head) and me (the Mac-Brains).
continues

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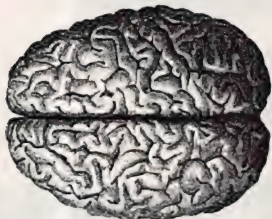
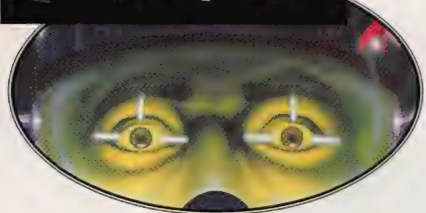
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We recently gave my old Mac Plus and ImageWriter printer to my father when I upgraded to the IIfx. This left us in the position of figuring out a way that we could both share my husband's Roland PR-2417 printer. After reading your article, which gave high marks to the PowerPrint, we decided to buy it, plus about 30 feet of cable to connect both of our computers (in different rooms) to the Roland printer. So far so good, except you left out a teensy-weensy important detail. If you are sharing a printer, you need a switch box; otherwise you have to disconnect cables and reconnect them directly to the printer every time you want to print something! Also, the switch box of choice is manual, not the automatic kind (which the salesperson assured us would work—probably). It seems so obvious now in hindsight (parallel versus serial), but it caused several days of grief.

Sharon Malone
Williams Lake, British Columbia, Canada

Lock the Dock

IN THE "BUGS & TURKEYS" SECTION of *News* in the October issue, the editors suggest that the lock-down slot on the back of the MiniDock is not useful because the Duo can be removed from the dock and stolen. The lock is important, however, when you just want to lock down the dock. Frequently the Duo goes everywhere you go, but the dock stays unattended and is vulnerable to theft. More important, the lock is vital for schools that use the MiniDock to provide a convenient network attachment for students with Duos. The docks would quickly disappear if they weren't tied down.

Brian Hannon
Hanover, New Hampshire

You make a good point. Also, that particular Turkey inadvertently implied that Kensington's MicroSaver locking technology was at fault, when the problem is Apple's implementation of the MicroSaver technology.—Ed.

Educator Feels the Pinch

AS A TEACHER WHO HAS JUST RECEIVED three Macintosh LC 520s in her school's computer lab, I couldn't have found your article more timely ("The Macintosh LC 520," September 1993). I was appalled, however, by Charles Seiter's rather flip remark that because the LC 520 is offered only through the educational channel, "expect a lot of folks to ask their favorite student or teacher to buy one on their behalf."

While this may have been a throw-away line to Mr. Seiter, it implies that there is a widespread practice of students and teachers' violating their agreements with Apple by purchasing hardware for their personal use. Such a comment strikes at the integrity of those of us in the educational field, and could jeopardize badly needed educational discount programs for hardware and software.

Tracy Anne Sena
San Francisco, California

No such implication was intended.—Ed.

Separate but Equal

REGARDING YOUR REVIEW OF THE Infinity 105 Turbo in the September issue: Stop criticizing products just because they have external power supplies. I actually prefer products with this setup. It reduces the amount of heat that a drive mechanism is exposed to; it is smaller and more convenient to transport; and the lack of a fan means one less moving part to fail, less dirt and dust in the drive case, and less noise pollution in my otherwise quiet home.

David Olarsch
Plymouth, New Hampshire

Random Notes

I'M WRITING THIS LETTER WHILE I'M on hold. A couple of days ago I paid a lot of money for a new LC III. I had a question about the free CD-ROMs that came with it, so I called Apple's toll-free customer-service line. Everyone is talking about Apple's revolutionary increase in customer service, so I couldn't believe my ears when the friendly recording said, "The wait for an Apple representative will be approximately 30 minutes. We understand this is frustrating . . ."

No argument here. I wonder if IBM, Compaq, or Dell put their customers on hold for half an hour.

Ari Stotland
Las Vegas, Nevada

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VOLTAGE DISTRIBUTION

VOLTAGE STUDY

Right. The complexity of digital systems requires a hierarchical organization. It's the only way to deal with the kind of combinatorial explosions that attend interlinking of billions of nodes, all functioning in parallel. You need nested hierarchies, but the real miracle of microelectronics is that these extraordinarily complex hierarchies can be incorporated into individual silicon chips, with virtual supercomputer capabilities.

Figure 1:

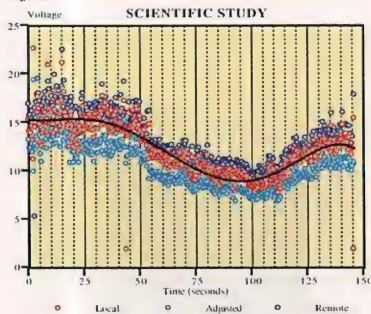
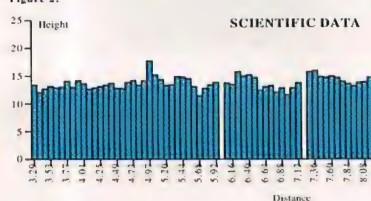


Figure 2:



You can put multiple graphs on a page and add extensive text.

Figure 1: You need nested hierarchies, but the real miracle of microelectronics is that these extraordinarily complex hierarchies can be incorporated into individual silicon chips, with virtual supercomputer capabilities. This fabulous supercomputer power can be ubiquitously distributed in the fibersphere. So hierarchies dominated exist, but they are ubiquitously distributed, which renders them an egalitarian force. When everybody commands a supercomputer, you give the average owner of a workstation the power that an industrial system commanded in the industrial era, or that a TV station owner commanded in the age of Broadcasting. In other words, the hierarchy is in the silicon rather than in the human organization.

Figure 2: When you take a train you go to the railway station at a scheduled time, you travel with the people who happen to be on the train and you go to preset destinations. This is what the current television world is like. You tune into the stations that have been prescribed through some collaboration between advertisers and TV executives in New York and Hollywood. Moving from broadcast model to the telephone is like moving from a railroad model to automobiles.

Graph Type Arrange View Options

New Graph

Overlay Graph

Change Graph Type

Apply Graph Format

Graph Attributes

Pie & Polar Settings...

Bar & Column Settings...

Quality Control Limits...

Histogram Settings...

Table Settings...

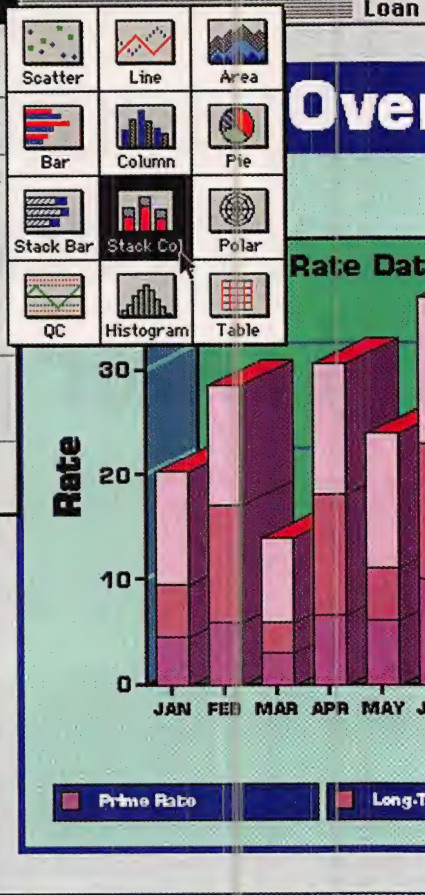
Group Legend

Group Graph

Switch Axes

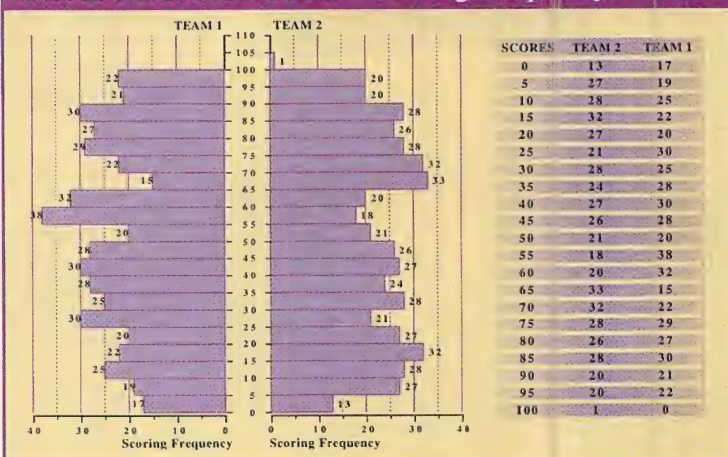
Graph to Objects

	Month	Prime Rate	Long
1	JAN	4.6	
2	FEB	5.9	
3	MAR	3.0	
4	APR	6.7	
5	MAY	6.1	
6	JUN	10.0	
7	JUL	6.2	
8	AUG	4.0	
9	SEP	6.3	
10	OCT	6.4	
11	NOV	6.4	
12	DEC	6.9	



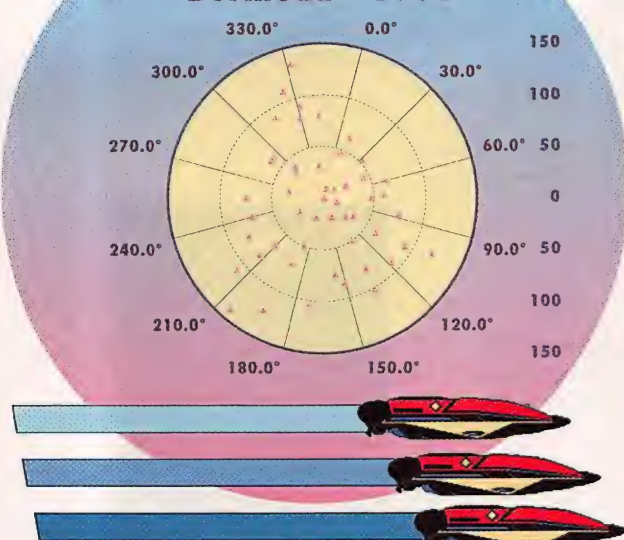
Select the type of graph and legend layout you want.

TEAM STATISTICS – Scoring Frequency



CA-Cricket Graph III gives you flexible control over axes.

Speedboat Vanishings Bermuda - 1989



It's easy to import graphics like these.

The Only Thing More Impressive Than These

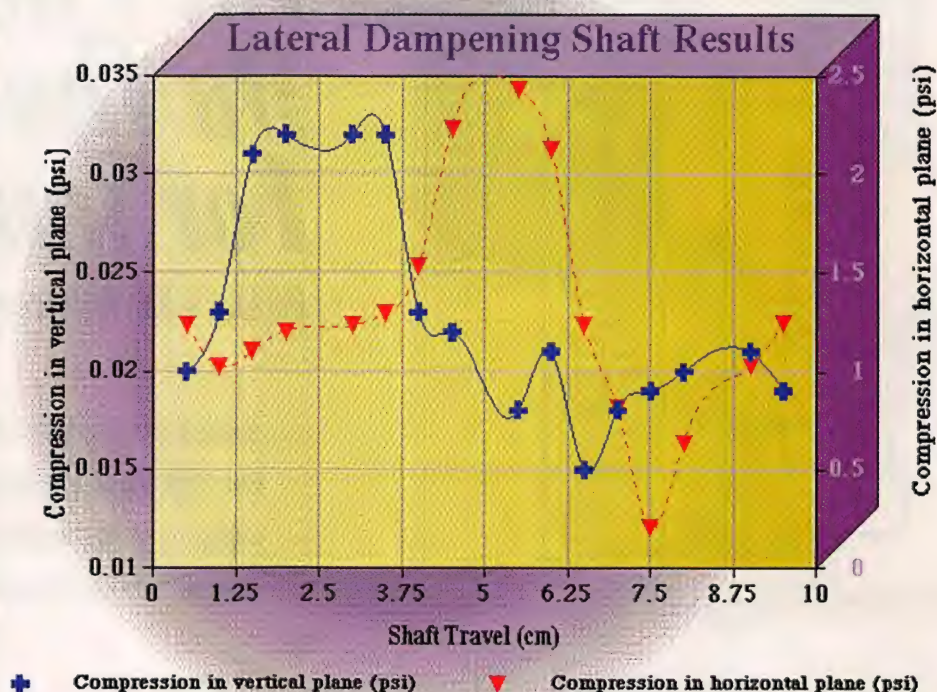
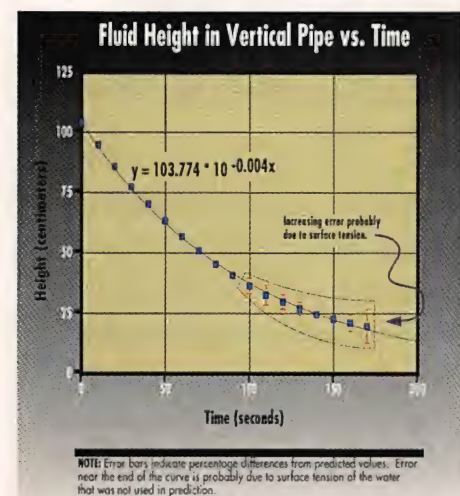
CA-Cricket® Graph III™ is back, and now it's better than ever.

It's so easy to use – and so powerful – that you can create complex graphs and charts like these in minutes.

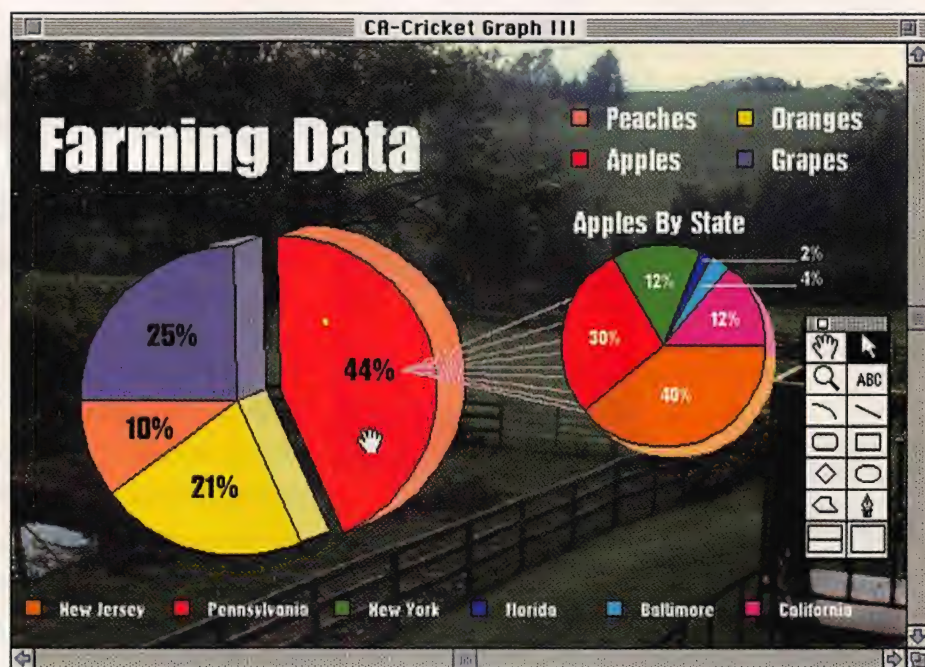


Lots of new features make data handling and color manipulation with your Macintosh faster and easier than you ever thought possible.

The new CA-Cricket Graph III is versatile, too, with formats for up to 24 different types of charts



The software gives you high-resolution, styled line choices like these.



You can add two types of depth to pie charts – dropshadow or isometric.

Graphs Is The Time It Took To Create Them.

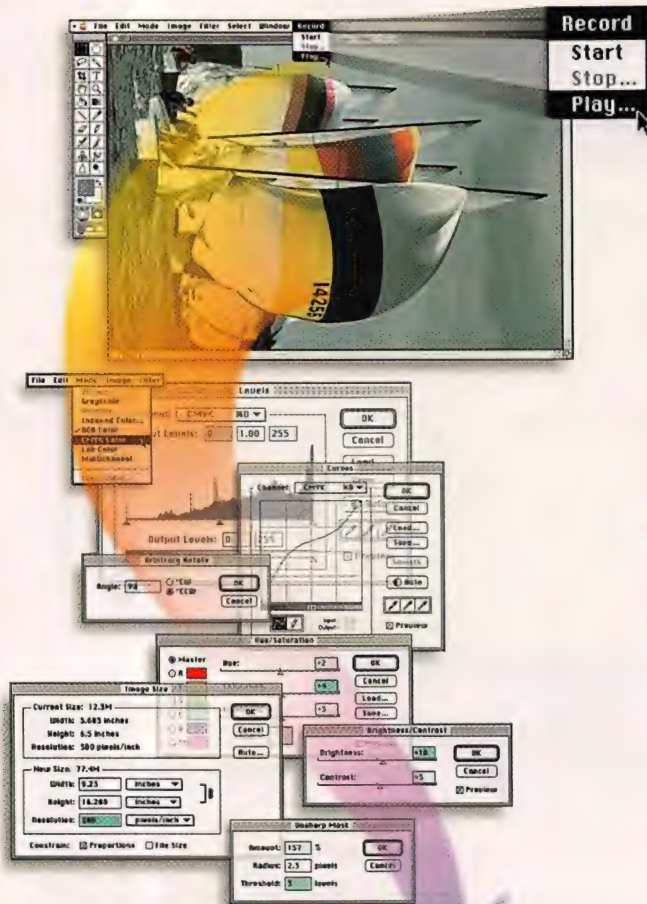
and graphs. Including histograms and table graphs, to name just a few.

And an expanded set of tools that will make your results look as impressive as those you see here. So order your copy today by calling **MacWAREHOUSE®** at 1-800-622-6222.

Whether you're an astronomer or a zoologist, you'll be creating graphs like this in no time.

New CA-Cricket® Graph III™

COMPUTER ASSOCIATES
Software superior by design.



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DayStar's Batch Processing Software For Photoshop

- ▶ Automates virtually any function within Photoshop
- ▶ One step batch processing of multiple images
- ▶ Background or foreground image processing
- ▶ Easy to use—no knowledge of scripting required

With PhotoMatic™, DayStar's revolutionary new Photoshop automation technology, you can automate any function or plug-in within Adobe Photoshop™.

PhotoMatic records virtually all functions in a "watch me" mode, saving all keystrokes and mouse clicks in an AppleScript compatible file.

PhotoMatic is easy to use—absolutely no knowledge of scripting is required to create and play scripts. For more flexibility, you can view and easily edit scripts. Rearrange functions and change values with the copy and paste commands.

You can play scripts on a single image or "batch process" multiple images. While playing scripts, you can put Photoshop in the background and work in other applications. If you use a Photoshop accelerator card like DayStar's Charger, you'll hardly notice the script is playing*. From your Mac, you can also play scripts on other Macs over the network. Either way, PhotoMatic gives you the ability to automate image production and have great results waiting for you.

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\$279 SRP



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Other brands and product names are trademarks or registered trademarks of their respective holders. Adobe, the Adobe logo, the Adobe Charged logo and Adobe Photoshop are trademarks of Adobe Systems, Inc. Product specifications are subject to change without notice. ©1993 DayStar Digital, Inc. * Accelerated functions "play" on the Charger card and thus free up the Mac's motherboard CPU to run the other applications.

MacBulletin

Apple to Ship Systems with DOS

At Comdex in mid-November, Apple Computer unveiled a DOS-compatible version of the Macintosh Quadra 610—basically a standard 610 with an Apple-designed 486SX add-in board and DOS installed. The surprising new system will be capable of running Microsoft Windows. Slated to ship in the first quarter of 1994, the new Macintosh configuration is expected to cost less than \$500 more than a Quadra 610. The board, which will work in existing Quadra 610s and Centris 610s, should be available for less than \$500. Apple, 408/996-1010.

PowerPC Upgrades for More Macs

Apple has licensed its PowerPC Mac system ROMs to DayStar Digital for use in PowerPC upgrades for Macs, including some for which Apple has not announced upgrades. The PDS boards are for the Centris 650 and the Quadra 650, 700, 800, 900, and 950. They're due when Apple ships PowerPC Macs, in the first half of 1994. Prices were not set. DayStar, 404/967-2077.

PowerPC for Workgroup Servers

Apple will offer PowerPC upgrades for the Workgroup Server models 60, 80, and 95 that will run System 7 and support print servers and file sharing. More details were unavailable. Apple says it will also develop native PowerPC versions of its AppleShare, AppleTalk Remote Access, and AppleSearch software. Workgroup Server 95 users requiring A/UX will not be able to upgrade until the release of PowerOpen, a version of Unix.

Apple Rebates

In a holiday promotion that ends January 31, 1994, Apple has begun giving instant rebates to buyers of most PowerBooks, ranging from \$100 for a PowerBook 165 to \$500 on a Duo 230 4/160 bundled with a Duo Dock and an Express modem. There's also a \$200 rebate on the Apple 16-inch Color Display and a \$300 rebate on the Apple Color Printer.

HP Rolls Out 600-dpi LaserJet

Hewlett-Packard has begun shipping the LaserJet 4MP, a 600-dpi, 4-ppm laser printer. The low-power-consumption \$1729 printer has PostScript Level 2 and enhanced PCL 5, automatic switching between languages, a fast RISC processor, 6MB of RAM, 80 scalable fonts, and a 250-page sheet feeder that handles envelopes and small stock down to 3 by 5 inches. Hewlett-Packard, 800/752-0900.

Apple's Low-Cost Color Monitor

To match its low-cost Macs, Apple has introduced the Apple Color Plus Display, a 14-inch color monitor with 640 by 480 resolution, a 67Hz refresh rate, .28mm dot pitch, and a price of \$305. The monitor meets guidelines for magnetic-field emissions. Apple, 408/996-1010.

SyQuest-Iomega Battle Escalates

In the battle for control of the removable-storage market, SyQuest is offering \$50 and a new SyQuest drive to owners who trade in Iomega's 90MB or 150MB Bernoulli removable-cartridge drives. Users get a choice of SyQuest's 88MB SQ5110C, 105MB AT-compatible SQ3105A, or 105MB SCSI-compatible SQ3105S drive. SyQuest declined to say how long the promotion would last. Separately, SyQuest announced the SQ1080, a 1.8-inch drive that uses 60MB or 80MB cartridges and fits in PCMCIA devices such as the Newton. Street prices were not set at press time. SyQuest, 510/226-4000.

Apple Profits Down

Apple reported a slight profit of \$2.7 million for its fourth fiscal quarter ending September 24, down from \$97.6 million in the same quarter of 1992. Apple also said it set records with quarterly revenues of \$2.14 billion—up 21 percent—and in unit shipments—up 36 percent—both compared with the same quarter a year ago. Apple cited the personal computer price war as reducing its profit margins.

News

EDITED BY TOM MORAN

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It's a Mac! It's a TV! Film at Eleven!

No, it's not a piece of stereo equipment or Batman's Macintosh. It's the Macintosh TV, Apple Computer's next step down the consumer electronics path. The company is betting that when the workday's done, you'll want to flip on this Mac—to watch television.

The Mac TV's performance is roughly that of the Mac IIx/Performa 600, combined with a 14-inch, cable-ready color television inside an LC 520 case that's painted black. Inside that imposing black case (even the keyboard, mouse, and cables are black) sits a full-featured Mac with a 32MHz 68030 microprocessor, a 32-bit data bus, 5MB of RAM, an integrated PMMU, and an Apple 14-inch Trinitron display. In a bone-jarring shock of product-line simplification, Apple is selling the machine in only one configuration: 5MB of RAM, a 160MB hard drive, and an internal AppleCD 300i CD-ROM drive. This Mac won't win any power-user contests; the main RAM is expandable to only 8MB, and the nonexpandable 512K VRAM limits you to 8-bit color. But as



Apple's Macintosh TV is a Mac, a TV, a CD player with stereo speakers—sorry this version cannot microwave your pizza, but it does include a remote control.

we've said, the computer is only half the package.

When it's time to catch the last half of "Monday Night Football," touch a user-definable key command and, *boink*, the Mac screen becomes a 14-inch, 16-bit color television. An internal cable-ready tuner

with a single coaxial input jack provides the signal, or there's an RCA input jack for plugging in a VCR or other video device. Sound is piped through a pair of stereo speakers in the base of the case, and you can listen to either the television or audio CDs while

you work, and even watch TV while your spreadsheet recalculates. Special system software supports two-channel closed-captioned transmission, channel scanning, and single-frame capture from video (no full-motion capture). The TV mode can also

be password-protected to make sure that Junior does his homework. For the final touch, couch potatoes get a remote control for channel surfing or controlling the CD-ROM drive with an audio CD in the slot.

Apple is planning to sell the Macintosh TV through a limited number of outlets—only about 250 nationwide, including the Video Concepts, Best Buy, and Tops chains. Most of those will be high-tech stores that cater to early adopters of consumer electronics—although Apple believes that the all-in-one package will also appeal to college students and will offer the Mac TV through higher-education channels accordingly. Apple is bundling several software packages with the Macintosh TV, including ClarisWorks 2.0, plus seven CD-ROMs, including the Kodak Photo CD Sampler and Grolier's Multimedia Encyclopedia. A list price hadn't been set at press time, but Apple expects the package to go for under \$2000. The Macintosh TV will list in the (full-price) Apple Catalog for \$2079. For that money, you're getting neither a state-of-the-art Macintosh nor a slam-bang television. But the Macintosh TV can serve well enough in both areas to sit in a college student's dorm, or a child's bedroom, or even in a home living-working space where you could tap out a letter to Aunt Marge in between watching "The Simpsons."

Is the Macintosh TV the Product of the Future or Hip Matte Black Gadget #4136? Apple appears to be hoping it's a little bit of both. While the company has one eye firmly on the convergence of the television, video, and computer markets (à la 500-channel cable and Vice President Gore's information super-highway), it also wants a piece of that multibillion-dollar consumer electronics market. Apple says that means shorter product-development cycles, products aimed at non-computer-savvy users, and most

important, having mass quantities of product immediately available for consumers to consume. Can Apple do it? Will the public buy the Macintosh TV? Tune in to next week's episode... same Mac time, same Mac channel. Apple, 408/996-1010.

—CAMERON CROTTY

Sweet 16AV Party

RASTEROPS COLOR MONITOR

The RasterOps Sweet 16AV 16-inch color display works with the built-in video of the Quadra 840AV and Centris 660AV, LC III, and PowerBooks. The 16-inch display features 832-by-624-pixel resolution at a 75Hz vertical refresh rate, with a dot pitch of .28mm. The product is currently shipping for \$1149. RasterOps, 408/562-4200.—CAMERON CROTTY



The RasterOps Sweet 16AV monitor works with Apple's AV Macintoshes.

All Your Software on One CD-ROM

APPLE SELLS MAC AND WINDOWS APPS

Breaking entirely new ground for the company, Apple has created Software Dispatch, a separate business unit that will distribute demo versions and full versions of



MAX SEABAUGH

between 75 and 100 applications from leading software vendors—all on free CD-ROM discs. Users will benefit because they will have nearly the equivalent of an entire software store on their desktops, along with the capability to try before they buy, and, for example, to purchase a disk-repair utility in the middle of the night without going farther than the telephone. Have you ever had to buy three databases before you found one you liked? With the trial versions of so many applications on CD-ROM, you could take extended looks at demo versions of several word processors, for instance, and then choose the best one for you.

The move into this market means that Apple will be trying to cut out the software-distribution intermediaries in a big way, so prices should be competitive with current street prices for the same software, according to Apple. Apple may also be cutting itself out of the loop in an odd way, since Software Dispatch will also distribute a set of two equivalent CD-ROMs containing software for Windows machines. Apple's plan is to have the contents of the Mac disc and the Windows discs be essentially the same, with contents ranging from games and educational programs to high-end desktop-publishing software, with all the classic application types and utilities in between.

Almost all the programs will have a try-before-you-buy *continues*

IBM Ramps Up PowerPC Production

IBM has announced that it is shipping production volumes of its PowerPC 601 microprocessor. When purchased in quantities of 25,000 to 50,000, the 50MHz version costs \$275 each, and the 66MHz version costs \$350 each.

Mirror Ships Tornado

Mirror Technologies has begun shipping its Tornado QuickDraw accelerator, which provides accelerated 24-bit color for monitors as large as 21 inches diagonally. The \$799 board can accept the ChargeCard, a daughterboard that speeds up some Photoshop functions by as much as 2000 percent. The ChargeCard lists for \$599 separately; the Tornado and ChargeCard together list for \$1299. 612/633-4450.

MacLinkPlus 7.5

This set of file-translation software updates from DataViz includes new translators for data from applications such as ClarisWorks, WordPerfect 6.0, MacWrite Pro, Ami Pro 3.0, Quattro Pro, WriteNow 3.0, Nisus, Lotus 3.1, FoxBase, and dBase IV. The \$109 Easy Open Translators includes only the file translators. The \$149 Translators Pro adds Macintosh PC Exchange, an Apple utility that lets your Mac read DOS disks. The \$199 PC Connect includes these components, plus a serial cable and modem software to physically connect a Mac and a PC. 203/268-0030.

FWB Hammers SyQuest Prices

FWB has announced that it is reducing prices on its hammerDisk line of SyQuest removable-cartridge hard drives by 19 to 24 percent. The hammerDisk 105 (105MB external) now retails for \$949, a drop of \$300. Cartridge prices have also been reduced by 13 to 16 percent. 415/474-8055.

mode, but a password will be necessary to unlock the full application. Naturally, when you call in, the operator will ask you for a credit card number. The password you get from the operator will be unique to your computer, according to Apple, so software pirates won't be able to pass a disc around with a list of passwords.

Documentation for the various programs will be shipped on the CD-ROM disc—about 12,000 pages of hypertext that you can navigate by using DocViewer on the Mac or with Adobe Acrobat on Windows machines. But if you prefer paper, you can order optional hard-copy documentation when you call to buy the software.

Apple said it will include the Software Dispatch CD-ROM with every CD-ROM-capable Macintosh, and will distribute it by direct mass mailings and through dealers who will be compensated for any eventual sales from the disc. The discs will be updated quarterly, with quicker revisions if necessary because of buggy applications. The service will also include a 30-day money-back guarantee. A list of technical-support numbers for the various applications is also on the disc.

Although the main aim at first will be selling software, Apple says Software Dispatch will also offer training cassettes and some hardware, such as a sound board designed for Windows machines (necessary to hear the QuickTime videos that describe the virtues of some of the Windows programs). The company also will not rule out the possibility that it might put something like a Sears catalog on CD-ROM, and just sell you everything you ever wanted and maybe even needed. The Mac disc should be appearing in early November 1993 in a CD-ROM drive near you. The two-disc Windows version will ship in the first quarter of 1994.

With about 10 million CD-ROM drives installed on

Macs and other personal computers, according to Apple, the electronic distribution of software via CD-ROM is gaining the attention of other vendors as well. Ingram Micro and The Mac Zone have individually announced plans similar to Apple's. Software-distribution giant Ingram Micro has created a division that offers a CD-ROM with between 100 and 200 applications, using encryption technology developed by Rainbow Technologies and also used by Software Dispatch. The Mac Zone Instant Access CD, which uses technology developed by European vendor Instant Access, is expected to include more than 150 applications and was slated to be available, for free, beginning in November 1993. Ingram Micro Technical Services Division, 714/835-6600; The Mac Zone Instant Access CD Center, 800/684-8080; Apple, 408/996-1010.—T.M.

Green Screen

ENERGY-SAVING MONITOR

The EPA's Energy Star program is generating a new area of competition for computer hardware manufacturers, particularly for monitor makers. Nanao's latest color display, the FlexScan F560iW, features a maximum resolution of 1280 by 1024 pixels at a 76Hz vertical refresh rate with a .26mm dot pitch, and complies with the Swedish MPR II emissions guidelines. In deference to the EPA's guidelines, the display automatically powers up and shuts down when you turn your Mac on and off

(sensing the presence or lack of horizontal and vertical sync signals). This feature also works with Apple's Energy Saver cdev to shut down the monitor after a predefined period of inactivity. The display will also go to a standby



The FlexScan 560iW senses when you turn your Mac off and when it shuts itself down.

mode when it senses that the screen is blank (the monitor can sense the lack of the blue component of a standard RGB signal), allowing energy savings with many screen saver packages that are now on the market. The F560iW is currently available for \$1699 from Nanao USA, 213/325-5202.—CAMERON CROTTY

BUGS & TURKEYS



You can print envelopes or you can use MacInTax, but with Hewlett-Packard's DeskWriter, you can't do both at the same time. If you print an envelope with driver version 3.9, you'll have to restart the printer before printing regular pages again. Driver version 3.1 will allow envelope printing, but it's not compatible with ChipSoft's MacInTax. HP expects to solve the problem in a future version of the driver.



For users of international versions of System 7, Intuit has released a free update to Quicken 4.0. Previously these users had to set System 7's Numbers control panel to U.S. figures, which worked only sporadically.



Printing PageMaker 5.0 documents on an Apple StyleWriter or Personal LaserWriter LS? Expect to wait a while—users have reported delays of up to 30 minutes on some QuickDraw printers. Aldus blames the problem on the drivers' handling of PostScript and says the solution lies with printer vendors. Apple, in turn, says the problem is Aldus's.



You'd think Adobe could make Illustrator 5.0 files import into Photoshop, but no such luck. Illustrator 5.0 gradients must be saved as Illustrator 3 files to import properly.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

Global Village Ships V.32terbo

FAST FAX MODEM

While many wait for the new CCITT V.Fast modem standard to be finalized, some companies are forging ahead, building on the V.32terbo standard developed and published by AT&T. Specifically, Global Village Communication has announced its \$399 Mercury line of fax modems, which are V.32terbo compliant—able to transmit and receive data at up to 19.2 Kbps.

The TelePort/Mercury (external), the PowerPort/

THE AMCoEX INDEX OF USED MAC PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
Mac SE/2MB/20MB	\$500	\$0
Mac Portable/1MB/40MB	\$600	-\$75
PowerBook 100/4MB/40MB	\$800	-\$50
PowerBook 140/4MB/40MB	\$1100	-\$100
Mac Classic/2MB/40MB	\$550	\$0
Mac SE/30/2MB/40MB	\$775	-\$50
Mac LC/2MB/40MB	\$600	-\$50
Mac II/4MB/40MB	\$600	\$0
Mac IIsi/3MB/40MB	\$800	-\$100
Mac IICx/4MB/80MB	\$975	-\$25
Mac IICI/4MB/80MB	\$1200	-\$175
Mac IIfx/4MB/80MB	\$1500	-\$100

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of October 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

Monitor Triplets

NEC MULTISYNCS MULTIPLY

NEC's new MultiSync 3V, 5FGp, and 6FGp color monitors all have energy-conservation circuitry aimed at keeping the EPA happy. The 3V, aimed at the small office/home office (SOHO) market, is a 15-inch, multi-scanning display with a .28mm dot pitch. Users will be eyeballing a 832-by-624-pixel resolution with a 74Hz vertical refresh rate.

The 5FGp and 6FGp multiscanning color monitors measure 17 inches and 21 inches, respectively. Both products feature a .28mm dot pitch, and both can display 1280 by 1024 pixels at a 74Hz vertical refresh rate. These two monitors also feature front-panel digital controls for brightness, contrast, horizontal size and position, and pin-cushioning.

All three monitors meet the Swedish MPR II guidelines for reduced emission of electromagnetic fields and can go into standby and suspend modes to ease power consumption (with the aid of Apple's Energy Saver control panel). The 3V has an estimated selling price of \$550, the 5FGp goes for \$1455, and the 6FGp for \$2535. Currently available from NEC, 708/860-9500.

—CAMERON CROTTY



The NEC MultiSync 3V is a 15-inch color monitor for the small or home office.

TimesTwo Again

Golden Triangle has updated its TimesTwo driver-level disk-compression software by giving it about 40 percent more speed, support for partitions, and MagicBoot, which the company says provides a built-in emergency disk on any hard drive. The update is \$29.95 to registered users; the list price for the full product is \$149. 619/279-2100.

Native PowerPC MiniCAD+

Graphsoft has announced that it intends to make a PowerPC native version of MiniCAD+ 5 available on the day that Apple releases its PowerPC machine. According to Graphsoft, a version for the 680X0 Macs will also be available at that time. 410/290-5114.

QMS Large-Format Printer

QMS has unveiled the QMS 860 Plus Print System, a 1200-by-1600-dpi laser printer that prints edge-to-edge on paper as large as 11 by 17 inches. The device can produce more than 100 shades of gray at 85 lines per inch. It emulates PostScript Levels 1 and 2, HP PCL 4, and other printer control languages. Currently available, the printer has a list price of \$5999. Multiple network connection options will be available. 205/633-4300.

Pinnacle's 1.3GB Optical Drive

The Sierra from Pinnacle Micro is a 1.3GB, 5.25-inch optical drive with an effective access time of 19ms. The drive uses a high-speed microprocessor and other electronics to achieve higher performance than other ECMA standard 1.3GB optical drives, according to the company. The Macintosh version of the Sierra lists for \$2995, and optical cartridges list for \$250. The Sierra optical drive began shipping in early November. 714/727-3300.

Mercury (PowerBook internal), and the PowerPort/ Mercury for PowerBook Duo (PowerBook Duo internal) all feature standard data compression and error correction, and are V.32bis (14.4-Kbps send/receive data) and V.17 (14.4-Kbps send/receive fax) compliant. Global Village has also added hardware to make the products compatible with PBX installations. The fax modems ship with ZTerm, ARA scripts, the company's GlobalFax software, and Caere's OCR software. Mercury modems should be available now, except the PowerPort/Mercury for the Duo, which is due in January. Global Village Communication, 415/390-8200.

—CAMERON CROTTY

Macs Read Longhand

CIC'S MACHANDWRITER

Thanks to Apple Computer's Newton marketing blitz, handwriting recognition was the hottest computing topic of 1993. No matter what your product was, if it didn't schedule a 12:00 meeting with Robert Maxwell when you scribbled "Lunch Bob," it was old news.

MacHandwriter, from Communications Intelligence, combines the company's Pen-Mac pen operating environment (which interfaces with the Mac OS) and Handwriter Recognition System Software with an ADB graphics tablet with a 6-by-9-inch active screen area and a single-button electronic pen, manufactured by CalComp. If you're just mousing around, the tablet behaves normally, but if you move into a window that expects text, your cursor becomes a pen.

The software also recognizes some gestures—for example, you can delete selected text, for instance, with a line-and-loop stroke familiar to copy editors. Also, you can invoke \mathbb{H} -key shortcuts by pressing the button on the side of the pen and writing the appropriate letter.

The product is scheduled to ship in December for \$399; it will include a crossword-puzzle game and Mathbook, a pen-based calculator. For tablet artists, a pressure-sensitive pen will also be available. Communications Intelligence, 415/802-7888.—CAMERON CROTTY

Two-Page Gray-Scale Monitors

A PAIR FROM RADIUS

You can plug either of Radius's two new monitors directly into a Mac with built-in video and see two pages in 256 shades of gray. The Two Page Display/20gs (TPD/20gs) and Two Page Display/21gs (TPD/21gs) measure 20 and 21 inches, respectively. Both produce resolutions of 1152 by 870 at 75Hz, and both work with the company's PowerSaver control panel (included) to reduce energy consumption to 12 watts when not in use. The TPD/20gs lists for \$999, and the TPD/21gs lists for \$1999. Radius expected to be shipping both products now. Radius, 408/434-1010.

—CAMERON CROTTY

Virtus VR: Worlds for \$99

WHO NEEDS REALITY?

Virtus is shipping a scaled-down version of its 3-D world-construction and -navigation software. Called Virtus VR, the \$99 package lets you model 3-D worlds by selecting objects from shape libraries

and placing them in a scene. All objects have control points that can be edited, and the company includes sets of bitmapped textures that you can place on objects, or you can import your own. Once you've built an environment, you can explore it in real time, clicking on navigation arrows or using a special cursor inside the 3-D window.

Virtus VR ships with five prefab worlds to explore: the White House; an undersea apartment and research complex; the Hindenburg blimp hovering over Paris; a mystery house; and Dealey Plaza, the site of John F. Kennedy's assassination. More world, texture, and object libraries are in the works. Virtus VR is available from Virtus at 919/467-9700.

—CAMERON CROTTY

MacTools 3.0

AUTOMATIC DISK MAINTENANCE

Advanced file management, the kind that usually takes place after you get a blinking question mark instead of a smiley Mac face on start-up, has always been a tense affair. Central Point Software's mission with the latest revision of MacTools is to make file recovery swift and sure, and add prevention earlier in the process.

The DiskFix data-recovery software can now install AutoCheck, a small application that automatically scans your volumes for corrupt files and resource structures, checks the overall disk structure, and can rebuild the desktop and do other maintenance, at user-determined intervals. To help prevent problems introduced from outside sources, MacTools AntiVirus can now scan StuffIt archives and notify the network system

TREND

A Pair of Portable Printers

COLOR UNDER \$400

Hewlett-Packard and Citizen America have independently brought out lightweight portable printers that can produce black-only or color output. The 300-dpi HP DeskWriter 310 thermal ink-jet printer, due out November 1, puts out 3 pages per minute of black text in draft mode and puts out about 1 page of color every 4 minutes. It includes 35 scalable fonts, TrueType, Adobe Type Manager, and HP's QuickDraw driver. The \$379 printer weighs about 4 pounds, runs on AC power or from a \$49 rechargeable battery, prints on plain paper or transparency film, and has a detachable sheet feeder. The DeskWriter 310 and the sheet feeder together list for \$455; the sheet feeder alone is \$99. To upgrade to color, users buy a \$49 color kit with a three-color ink cartridge and instructions, and swap the cartridge into the printer. The color ink cartridge (\$34.95 by itself) combines three colors to produce black. Hewlett-Packard, 800/538-8787.

The Citizen Notebook Printer II, also due on

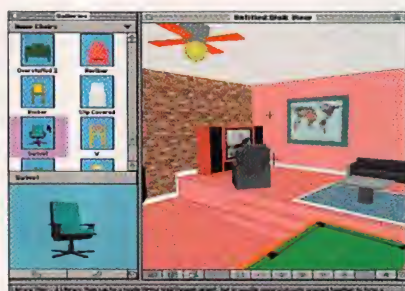
November 1, will list for \$399. It can print 2ppm of black text at 360 by 360 dpi, or (2 to 5) minutes per page of color, on plain paper or transparencies. The Notebook Printer II includes four fonts, and



The \$379 HP DeskWriter 310 portable printer can produce color images or black text.

works with TrueType and Adobe fonts. It uses heat and some pressure to transfer toner from a ribbon and bond it to plain paper or transparency film. Citizen's printer weighs a mere 2.6 pounds and also runs from a rechargeable battery (\$69). It includes an internal 5-page sheet feeder, and Citizen offers an optional 30-sheet feeder (\$69). The toner tape cartridges sell for \$4.99 for black and \$6.99 for a four-color cartridge. Citizen America, 800/477-4683.

—T.M.



The Virtus VR application lets you model 3-D worlds, then explore them in real time.

administrator of possible infection of protected nodes.

Central Point also made it easier to recover trashed files. The TrashBack extension prevents a user-defined (unlimited) number of deleted files from being overwritten after the Trash has been emptied. Selecting a file from the TrashBack submenu under the Finder's Special menu pops the file back into its original folder.

Also new in MacTools 3.0, FileFix can salvage damaged files created by newer versions of Microsoft Excel (4) and Word (5). Finally, FastCopy returns (after a hiatus during MacTools 2), combining faster floppy copying with Apple Disk Copy compatibility. MacTools 3.0 is currently available for \$149.95 from Central Point Software at 503/690-8090.

—CAMERON CROTTY

To Backup 50 GB, Two Recording Heads Are Better Than One.

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AT&T	DEC HSC	IBM RISC/	Douglas	PC 386/ix	Sequent	Unisys
Basic-4	DEC Q-Bus	6000	Motorola	PC MS-DOS	Silicon	Ultimate
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New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY MACWORLD. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS, WITH 1MB OF RAM, RUNNING SYSTEM 6. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY MACWORLD. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

Brilliance 2130 CCM

This 21-inch color monitor sports a .29mm dot pitch, multiple resolutions up to 1152 by 870 (72Hz), and digital controls for horizontal and vertical placement and size, color matching, and others. Display settings can be saved—presets are included. The display meets the Swedish MPR II emissions guidelines. \$3499. Philips Consumer Electronics, 310/217-1300, 800/835-3506; no fax.



Brilliance 2130 CCM

CentrumRemote

Now that support for AppleTalk Remote Access has been added to this remote network server, Macintosh users can dial in to a server that also supports users of DOS, Windows, and Unix machines. The product supports DECnet, Banyan VINES, Novell IPX, NetBEUI, TCP/IP, and XNS, and can also serve as a dial-up router for LAN-to-LAN connections. 4 ports \$3495; 8 ports \$4495; 16 ports \$6295. Centrum Communications, 408/894-1800; fax 408/894-1808.

DGR 650 REM

A SCSI, 5¼-inch removable-media optical drive that stores up to 650MB on a single cartridge. The product ships with one cartridge and CharisMac's Anubis driver software. \$2199. DGR Technologies, 512/476-9855, 800/235-9748; fax 512/476-6399.

The Diskless Mac

Organizing a computer lab is hard enough even without booting multiple machines separately by hand. But by installing this declaration ROM on a client Macintosh's Ethernet card and installing the server software, you can boot any number of client Macs from a single Mac, NetWare PC, or Unix server. The latest version of this package completely disables the client Macs' floppy drives during the boot process for increased security. Also, if a server is not found, the ROM will stop the start-up entirely. \$149. Sonic Systems, 408/736-1900; fax 408/736-7228.

MacSIMMiser

Bought a new Macintosh that takes 72-pin SIMMs and don't know what to do with your old 30-pin boards? You can plug up to four 30-pin SIMMs into this board and then click the whole shooting match directly into the 72-pin SIMM slot of your new Mac. All SIMMs used must be the same size and speed. \$99.95. Interex Computer Products, 316/524-4747; fax 316/524-4636.

ProModem FaxNet

Give your networked colleagues a fax modem of their very own, or at least one to share. The product plugs directly into an AppleTalk network as a node and transmits both faxes and data at 14.4 Kbps. ProModem FaxNet is compliant with the V.32bis, V.42, V.42bis, and Group III standards, and it ships with a site license for the company's MaxFax network fax software. Users can fax documents directly from applications and monitor their status with an included desk accessory. The fax modem ships with management software that recognizes all other FaxNet modems on the network, automatically routing traffic to the next available unit. \$999. Prometheus Products, 503/692-9600, 800/477-3473; fax 503/691-1101.

RISCRouter 3000E

You can never be too rich or support too many protocols. The latest version (1.2) of this router adds Novell's IPX to its list

of routed protocols, which includes AppleTalk, TCP/IP, and DECnet Phase IV. \$3495. Compatible Systems Corp., 303/444-9532, 800/356-0283; fax 303/444-9595.

SC-528MXL

This 15-inch multiscan color monitor features a maximum resolution of 1280 by 1024 pixels (at a 60Hz vertical refresh rate) and digital controls. The display also meets the Swedish MPR II emissions guidelines, ships with a tilt-and-swivel stand, and includes power-down circuits that automatically cut energy consumption when not in use. An adapter is required and included. \$659. Samtron Displays, 310/802-8425; fax 310/802-8820.

SCSI AutoSwitch SMA-924

You'll get plenty of SCSI with this switching device. It's a box with two independent, 50-pin SCSI ports and one common port. You can either hook up two Macs to a single SCSI chain, or hook two full SCSI chains to a single Mac. In the first case, the AutoSwitch detects the demand from a system and automatically switches the connection. In the second setup, you must manually throw an A/B switch, depending on which chain you want to use. The product can handle both SCSI and SCSI-2 Fast simultaneously. \$795. Ancot, 415/322-5322; fax 415/322-0455.

SMDSTalk/DS0

With this NuBus card, you can connect a Mac server, router, or client directly to a Switched Multimegabit Data Service (SMDS). The product is connected to the SMDS network through an external CSU/DSU (not included) and can be used with the AppleTalk Internet Router or via MacTCP. The package ships with diagnostic, configuration, and performance-monitoring applications. \$1195. MultiAccess Computing, 805/964-2332; fax 805/681-7469.



Solus 4

Solus 4

For your bigger jobs, a 400-dpi LED plotter like this one might come in handy. The product features 10-ppm A-size output, 3-ppm D-size output, dual paper rolls, parallel and serial interfaces, and options for SCSI or Ethernet connections. It also recognizes HPGL, HPGL/2, CCRF, CALG4, TIFF, and PostScript formats. \$19,995. CalComp, 714/821-2000, 800/932-1212; no fax.

Third Wave CD-ROM Changer

Blazing speed and CD-ROM aren't necessarily the best of friends, but this SCSI CD-ROM drive's six-disc magazine might help you forget that. The product uses the Pioneer drive mechanism, and ships with CharisMac's Anubis driver software, which includes AllCache caching software. \$1399. Third Wave Computing, 512/477-9845, 800/880-7555; fax 512/476-9241.



Triton 8GB

Triton 8GB

When backing up a network, the more storage space you have, the better off you are. This tape drive uses the Wang-DAT mechanism with 120-meter tapes to store 8GB to 12GB of compressed data per cartridge (or 4GB in DDS-2 native mode). The drive also accepts 60m and 90m tapes. The unit ships with a single cartridge, plus Dantz's Retrospect backup software. An internal version is available, as is a 32GB autoloader version. External \$1799; internal \$1699. Microtech International, 203/468-6223, 800/626-4276; fax 203/468-6466.

SOFTWARE

Archiforms

If Romulus and Remus had had the proper software, perhaps Rome could have been built in a day. This package enhances architectural-project record-keeping by automating forms preparation. Ranging from design to contract continues

New Products

administration, the software covers site instructions, payment certificates, and change orders. 2MB min. memory. \$302. Sanctuary Woods Multimedia Corp., 415/578-6340, 800/665-2544; fax 415/578-6344.

Batman: The Animated Series Universal Clip Art

Imagine starting your next sales memo with a 2-inch graphic of Batman or the Joker. The images in *Batman: The Animated Series* can be used with Brotherbund's Print Shop Deluxe or exported as EPS or PICT files. The collection also includes Catwoman, The Penguin, Alfred, the Batplane, the Batmobile, and others. \$19.99. Gametek, 305/935-3995; fax 305/932-8651.



Batman: The Animated Series Universal Clip Art

Caduceus Science Review

An illustrated and animated science review program that includes biology, chemistry, organic chemistry, and physics modules. The product is constructed in HyperCard and MacroMind and follows the recommended syllabus of the Medical College Admissions Test. Each module is available separately. 4MB min. memory; color version requires 8-bit color. Monochrome \$150; color \$250; individual modules: monochrome \$50, color \$130. Scientia, 617/776-3427, 800/453-4725; fax 617/776-3427.

Control Lab

What do you get when you cross Lego blocks with a high-school science project? A system that includes motors; lamps; temperature, touch, and light sensors; a serial interface box that plugs into your Macintosh; and control/monitoring software. Users write and edit procedures using a modified version of Logo, creating projects like a temperature-controlled greenhouse, a color-code reading system, a motorized car and dynamometer, and a motorized vertical-lift bridge. \$750. Lego Dacta, 203/749-2291, 800/527-8339; fax 203/763-2466.

CorelSCSI for Macintosh

Hiring a driver isn't all that expensive—if you're buying a SCSI driver, that is. This one optimizes SCSI performance, and it supports optical WORM and rewritable drives, as well as the ISO 9660, High Sierra, XA, and multisession Kodak

Photo CD standards. The package also includes CorelMosaic, a file manager, and Corel CDAudio, an audio CD player. \$99. Corel, 613/728-8200, 800/836-3729; fax 613/728-9790.

Expressionist 3.1

If you want technical equations and symbols in your documents, you could practice with a pen and straightedge, or you could ask your Mac for help. The latest version of this equation-editing software features automatic spacing, support for Asian characters, as well as a translator that can import equations from MathType and the Microsoft Word Equation Editor. \$159. Prescience Corp., 415/543-2252, 800/827-6284; fax 415/882-0530.

FaxCom for Macintosh

With this software client, you can connect Macintoshes over Ethernet to Biscom's multichannel fax servers. Users select the fax server from the Chooser, and the package comes with custom cover sheets, phone-book management capabilities, delayed and multiple-destination faxing, and PostScript compatibility. Fax servers sold separately. Server software package \$1995; ten-user license \$495. Biscom, 508/250-1800, 800/477-2472; fax 508/250-4449.

Flight Commander

Sure, anyone can fly a plane, but do you have what it takes to be a squadron commander? As you play this air-strategy game, you divide your time between devising plans of attack and



Flight Commander

giving flight instructions to pilots. Game scenarios take place in the skies over a range of times and places, from the Korean War to somewhere in the next century. Additional features include adjustable complexity/realism options, descriptions and performance data for over 110 combat jets, and computer-controlled wingmen. \$69.95. Big Time Software, 410/366-8984; no fax.

Ft-In Calc

Calculating in feet and inches is no fun, so why not let your Macintosh do it? This calculator performs basic arithmetic and trigonometric functions, including calculating angles, arcs, chords, and circumference. You can edit equations once you've performed them, and the software will recalculate the solution. \$39. NDA, 202/667-1494; fax 202/667-1494.

Getting Started with the ClarisWorks Database

ClarisWorks users get some help from this six-lesson class on how to design and create their first database, develop

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screen and report layouts, incorporate graphics in their printouts, and use macros. The package includes a 48-page manual and a data disk with the files used in the tutorials. \$19.95. ClarisWorks Users Group International, 313/454-1969; fax 313/454-1965.

Intelligent Questionnaire

Do you find yourself asking the same questions over and over again? You could try talking to someone besides yourself, or you could let this forms-creation software automate your efforts. The package allows you to develop a set of questions and answers that create a document. Depending on the answers the user gives, the software can alter the text of the final document within parameters you set. Gender-dependent parts of speech, for instance, can change depending on who is filling out the document. Document can be exported as text for database manipulation, and user-definable prompts help eliminate invalid answers. \$695. Performance Guild Associates, 817/326-4063; fax 817/326-4063.

IRMA WorkStation for Macintosh

Connecting to an IBM mainframe might be a tough job, but someone's got to do it. Version 3.1 of this terminal-emulation software supports TN3270 for connections over a TCP/IP internet, as well as NetWare for SAA, and Token Ring. \$425. Digital Communications Associates, 404/442-4000, 800/348-3221; fax 404/442-4366.

Kid's Studio

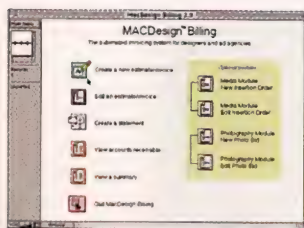
The main attraction of this simple multimedia-creation software is a set of "cookie cutter" cut-and-paste tools that cut sections of images into starbursts, hearts, lightning bolts, hands, and other shapes. The software includes libraries of 8-bit color images, plus paint and text tools; users can import Photo CD images and save final projects as QuickTime movies. 4MB min. memory; requires color Mac LC and System 7. \$59.95. CyberPuppy Software, 716/436-3570, 800/787-2983; fax 716/436-2783.

Living Desktop

Another shot fired in the battle to beautify your desktop, this software puts pretty patterns in place by altering the ppat system resource. The package includes 150 background patterns; you can switch between them using a built-in, configurable timer. Requires Mac Classic. \$59.95. Mantis Development, 617/969-6434, 800/230-6434; fax 617/647-9636.

MacDesign Billing

This set of FileMaker Pro templates helps artists and graphic designers estimate job costs and then invoice and bill clients. Forms include categories for most common costs and fees and use familiar industry terms. The system is password protected; includes a contact database; sorts and searches by client, invoice, and date; and prints mailing labels and envelopes. Requires FileMaker Pro 2.0. \$99. Desktop Graphic Services, 310/391-5275; fax 310/391-9865.



MacDesign Billing

MacInteriors

Create a house inside your Macintosh—without even applying for a construction permit. You define the size and shape of your rooms and add stock or custom 3-D objects. The software then creates a three-dimensional rendering that you can rotate and view. You can drag and drop objects by hand or place them by typing in location measurements, and you can assign colors, patterns, and dollar values to any object in a room. The software tracks expenses and automatically renders views and elevations. \$129. Microspot USA, 408/253-2000, 800/622-7568; fax 408/253-2055.

MacVoice

Take a Macintosh, add a Xyzel 1496 series modem and a pinch of this software, and you've got a voice-mail system. The program supports multiple mailboxes (chosen via Touch-Tone), automatic power-failure recovery, remote playback, send-and-receive fax capability, plus support for distinctive-ringing and caller-ID services. Requires Mac

II, System 7, Xyzel 1496 series modem. \$19.95. Raleigh Shareware & P. D., 919/380-7526, 800/237-8128; fax 919/380-7526.

QuickColor

Ted Turner can do it to old movies, so why shouldn't you do it to your HyperCard stacks? This software lets you add color to your cards and buttons; plus it lets you include PICT files in your stacks as resources. You select the card or button and choose how you want to alter it, and the software creates the necessary commands and inserts them in your stack. Requires color. \$25. Bliss Interactive Technologies, 512/338-2458; fax 512/892-5282.

Sonar Image Personal Edition

A smaller version of the company's document-imaging software, this package combines scanner control (single- and double-sided pages, plus document-feeder support), optical character recognition, and text retrieval using the Sonar search engine. Boolean, proximity, and wild-card searches are possible, and found documents can be automatically ranked by customizable relevancy parameters. Users can print both selected excerpts and full-page images. Requires Mac II. \$795; six-user license \$1929.50. Virginia Systems, 804/739-3200; fax 804/739-8376.

SoundScope/LC

When you must know down to the millisecond how a sound looks, you might *continues*

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Circle 8 on reader service card



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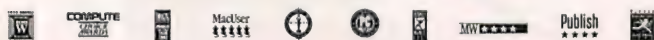
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Paul Cézanne



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Circle 190 on reader service card

New Products

want to check out this sound-analysis package. On the software side, you pick the tools you want to use, choosing from a list of routines that includes FFTs, expanded-time waveforms, and spectrograms, plus speech-analysis functions such as jitter, shimmer, and fundamental frequency. The hardware consists of a 16-bit stereo digitizing board, a Shure microphone, Rane pre-amp, and Bose speakers. 4MB min. memory; requires LC-family Mac or Color Classic and System 7.01. \$4690. GW Instruments, 617/625-4096; fax 617/625-1322.

Star Trek: 25th Anniversary

Explore space, the final frontier in an action adventure game that puts you in the persona of Captain Kirk. You pilot the Enterprise, manage landing parties, and guide Spock, Dr. McCoy, and the rest of the Enterprise crew through eight episodes filled with puzzles and mysteries. As you encounter Klingons and Romulans, you hear a complete musical score and sound effects digitized from the original series. 3.5MB min. memory; requires color. \$59.95. MacPlay, 714/553-3522, 800/736-5738; fax 714/252-2820.

Volume 26: Objects & Icons

Clip art collection features 554 industry icons and everyday consumer symbols. The set contains 56 recycling clips (including plastics-recycling symbols), 18 internationally recognized disabled-access symbols, plus icons for cars, A/V equipment, copiers, and gizmos such as cellular phones, computer chips, and gears. All images are Adobe Illustrator files. \$99. Image Club Graphics, 403/262-8008, 800/661-9410; fax 403/261-7013.

Where in the USA Is Carmen Sandiego? Deluxe Edition

You know her, you love to hate her (or at least your kids do), and now she’s back in the United States with a new musical score, 51 digitized scenery images, 50 maps, characters that speak with digitized voices, and 15 sneaky new gang members. Players must follow clues to track Carmen and her coconspirators across the USA, retrieve filched national treasures, and bring the evil-doers to justice. 4MB min. memory; requires color, 13MB free hard disk space. \$49.95. Broderbund Software, 415/382-4400, 800/521-6263; fax 415/382-4419.



Where in the USA Is Carmen Sandiego? Deluxe Edition

CD-ROMS

Capitol Hill

Are you glued to CNN during congressional debates? Always skipping to

the political pages of your local newspaper? This disc shows you what it’s like to be a member of Congress. You will be sworn in, tour the Capitol, conduct budget reviews with your staff, and vote on bills. The presentation includes video clips, photographs, and narration. \$49.95. Software Toolworks, 415/883-3000, 800/234-3088; fax 415/883-3303.

Educorp Shareware CD-ROM 8.0

Not one, but two discs full of shareware and public domain utilities, desk accessories, games, clip art, sounds, fonts, and graphics, as well as communications, business, productivity, and education software. How much data? We’re talking about roughly 1GB worth of stuff. The package comes with a HyperCard browser to give you a taste of a specific file (instructions, sample graphics, and sounds) before you retrieve it. 4MB min. memory. \$149. Educorp, 619/536-9999, 800/843-9497; fax 619/536-2345.

Jac-Kit

All the software that you need to get up and running on Internet, including navigation tools, file retrieval, compression/decompression, and viewing tools, plus search agents. An electronic directory of known online books and databases is included, along with a reference desk with dictionaries, E-mail addresses, and goodies like the CIA World Factbook. \$74. ElectroHouse Marketing, 919/933-9830; no fax.



Soundsations

Soundsations

Searching for the perfect sound can mean a lot of time in a field with a microphone, waiting for some heifer to moo just right. If you’d rather use sounds than gather them, this disc of sound effects might be the answer you’ve been looking for, from cartoonlike boinks and bops to animals, musical instruments, machinery, and human sounds. All clips are sampled at 22KHz, stored as System 7 sounds, and include a brief description. \$39.95. Softbit, 714/251-8600; fax 714/261-7977.

ACCESSORIES

Action Mouse for Macintosh

This ADB mouse has two buttons, and with the included control panel you can set either one to send a double-click, a click lock, or a ⌘-key to your Mac. Alternately, you can select an application to launch with a single click, or constrain mouse movement to the horizontal or vertical axis. Clicking on both buttons simultaneously simulates a third cursor continues

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Circle 88 on reader service card

New Products

tomizable button. \$72.50. PointTex, 909/594-6321; fax 909/594-7318.

LapTrax

You've probably got all kinds of surge protection for your desktop computer, but what about your PowerBook? Who knows what kinds of nastiness could be lurking in the power lines at the hotel or airport? This surge suppressor has two 120-volt AC-out ports, fits in your hand, and weighs about 12 ounces. \$89.95. EFI Electronics, 801/977-9009, 800/877-1174; fax 801/977-0200.

PowerCharge Single and Dual

Put a charge on batteries for the PowerBook 140, 145, 145B, 160, 165c, 170, 180, and 180c. Both the Single (one-battery capacity) and the Dual (two-battery capacity) feature fast and trickle charging, as well as a deep discharge cycle that conditions the batteries, preventing the memory effect that can plague NiCad cells. An adapter for a car lighter is sold separately. Single \$69; dual \$99. Applied Engineering, 214/241-6060, 800/554-6227; fax 214/484-1365.



PowerCharge Dual



Switchboard T4

Switchboard T4

If you live in an area where the phone company offers distinctive ringing service, you can use this box to switch phone calls between up to four devices. The product does not add any phone lines—only one call can come in or go out at a time—but that call can be routed to the appropriate phone, fax machine, or modem. The unit has one phone line-in jack, four phone line-out jacks, and doesn't require an external power supply. \$129. Telephone Products, 206/286-0196, 800/829-5960; fax 800/829-3940.

BOOKS

Desktop Marketing with the Macintosh

If you build it, they will come; but if you don't tell them about it, they won't buy it. This book guides readers through creating a direct-marketing campaign, explaining how to use the Macintosh to find and keep new customers, sell more product, and increase market share.

Written by Tracy Emerick and Stacy Gasteiger. 366 pages. \$34.95. Brady, 317/581-3500, 800/428-5331; fax 317/581-3550.

Learn C++ on the Macintosh

How to get up and running with object-oriented programming and C++ on the Macintosh. Readers will learn how to write, edit, and compile basic C++ programs. The author, Dave Mark, begins with a brief refresher on C, and then introduces the basics of object-oriented programming, including lessons on derived classes, operator overloading, and I/O stream functions. The book comes with a stripped-down version of Symantec's C++ compiler. 440 pages. \$36.95. Addison-Wesley Publishing Co., 617/944-3700, 800/358-4566; fax 617/942-1621.

Macworld Macintosh Secrets

If you've ever wondered how to make any file or folder invisible, reclaim the hidden 4MB on any hard drive, make a PowerBook battery last 5 hours per charge, or use 43 undocumented control-panel features—or if you just want roughly 9MB of commercial and shareware programs—you might want to check this book out. Written by Macworld's own David Pogue and Joseph Schorr. 996 pages. \$39.95. IDG Books Worldwide, 415/358-1250, 800/762-2974; fax 415/358-1260.

Mac, Word, & Excel Desktop Companion

Tips, hints, and instructions on how to

get up and running on System 7 and System 7.1, Microsoft Word 5.1, and Excel 4.0 are all wrapped up in a single book and peppered with anecdotes about the computer industry. Readers will learn about fonts, managing memory, formatting in Word, working with formulas in Excel, and moving back and forth between the two with a minimum of fuss. Written by Tom Lichty. 370 pages. \$21.95. Ventana Press, 919/942-0220, 800/743-5369; fax 919/942-1140.

The Tao of AppleScript

Move closer to the day when your computer does all your work for you with a single keystroke. This book, written by Derrick Schneider of BMUG, introduces readers to the world of AppleScript with tutorials and humor. An accompanying disk includes the AppleScript extension, QuickTime 1.6, a script editor, Script-Finder Liason 1.3, and a scriptable text editor that is designed for use with the book. 278 pages. \$24.95. Hayden Books, 317/581-3500, 800/428-5331; fax 317/581-3550. **m**

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

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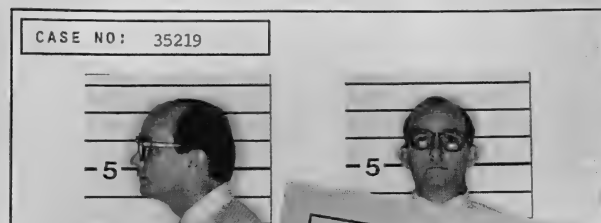
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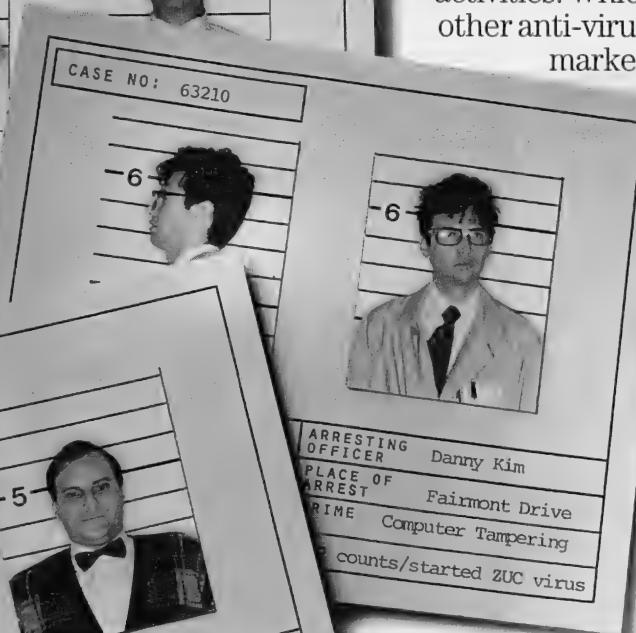
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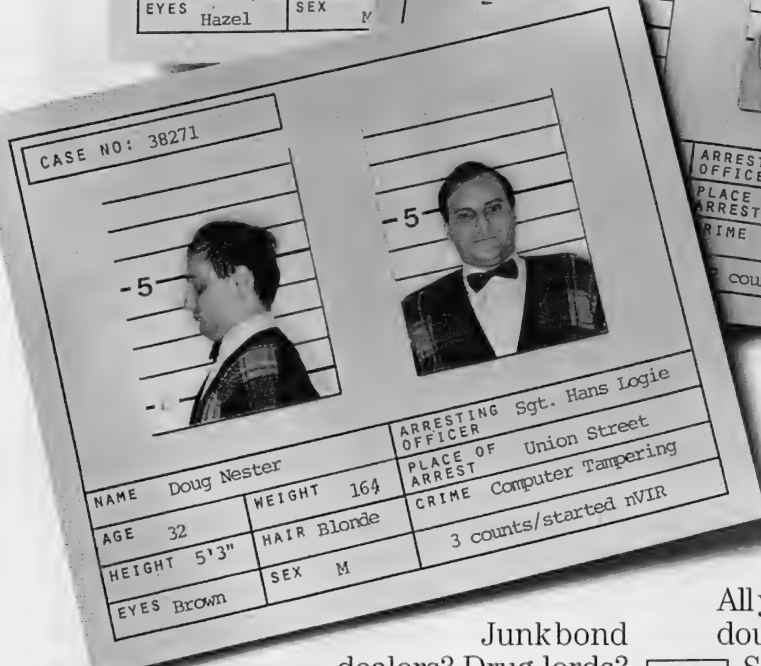
CASE NO: 35219

NAME Randy Hibbitts	
AGE 39	WEIGHT 2
HEIGHT 5'7"	HAIR Blk
EYES Hazel	SEX M



CASE NO: 63210

ARRESTING OFFICER	Danny Kim
PLACE OF ARREST	Fairmont Drive
CRIME	Computer Tampering
3 counts/started ZUC virus	



CASE NO: 38271

NAME Doug Nester		ARRESTING OFFICER	Sgt. Hans Logie
AGE 32	WEIGHT 164	PLACE OF ARREST	Union Street
HEIGHT 5'3"	HAIR Blonde	CRIME	Computer Tampering
EYES Brown	SEX M	3 counts/started nVIR	

and various software programs, you need SAM 3.5 anti-virus software.

You see, SAM will constantly monitor for 14 suspicious viral activities. Which is more than any other anti-virus program on the market. And it's the only

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Nope, they're computer hackers. And judging by their physical appearance, you wouldn't think you'd need any protection from them. But you do. Or should we say, your computer does.

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JANUARY 1994

Reviews

Adobe Premiere 3.0

QuickTime Video-Editing Software

PROS: Can mix 99 tracks; previews movies at full-frame rate; good use of QuickTime acceleration boards; Sequence window serves as micro-editor. **CONS:** Previewing in background is slow; few new gee-whiz features. **COMPANY:** Adobe Systems (415/961-4400). **LIST PRICE:** \$695.



IT'S FUNNY HOW THE PACE OF progress sharpens our senses and lifts our expectations just in time to be ready for the next advance. Back when Premiere 1.0 debuted, *Macworld* gave it the highest rating, as much an endorsement of QuickTime as an endorsement of Premiere itself. In retrospect, however, it's amazing how spartan the program really was. With the limitless expanse of digital-video editing at its disposal, Premiere adopted the staid but stalwart model of the double-deck studio. You had two choices. Fade from track 1 to track 2, or fade from track 2 to track 1. Granted, you could superimpose an additional sequence, introduce still images and masks, and overlay sound tracks, but folks have been able to do that since "I Love Lucy." Many experienced users were left wondering, besides the transition effects, where does the digital benefit come in?

But wouldn't you know it, just as we're ready for Premiere to be something better, it makes the valiant effort with version 3.0. Now instead of 2 video tracks, you can juggle as many as 99—the original 2 plus 97 superimposed tracks—not to mention the same number of audio tracks. Premiere doesn't overwhelm the senses by expanding the Construction window to nearly 200 rows. In fact, if you're familiar with previous versions of Premiere, you'll see the same familiar



DIANE FENSTER

interface you saw in the past. But now you can increase your working space, using the Add/Delete Track command, and then drag a new video sequence into play. As always, Premiere has integrated this new capability so seamlessly that you'll find yourself perfectly at home within minutes of removing the shrink-wrap.

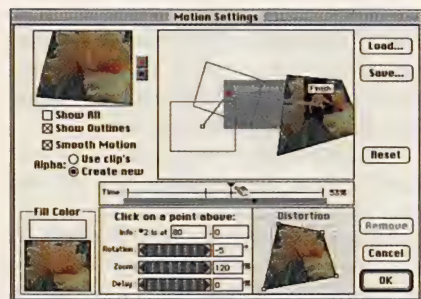
Previews That Actually Work

Another of Premiere's past problems that Adobe has remedied with version 3.0 is the pace of the previewing function. In previous versions, the preview typically showed you every third frame or so and occasionally hung up on an image for as much as a full second, hardly helpful in testing out subtle transitions and complex titling effects. Now you can preview a sequence at the maximum frame rate and size supported by your system. If your

computer is equipped with a QuickTime acceleration board, such as SuperMac's Digital Film or RasterOps' MoviePak, you can use the board to process, scale, and speed up the preview. This means you can preview full-screen sequences directly to videotape rather than using the Print to Video command, great for quick fixes and last-minute demos.

Premiere makes previews faster by rendering the sequence to RAM or to a temporary disk file—your choice—prior to displaying the sequence on screen. First time out, the previewing process can be as time-consuming as making a QuickTime movie (of the same length as the preview). But each additional time you preview the same sequence, Premiere automatically abbreviates the rendering time by updating only those sections of the preview that have changed, a real

bonus to users who find themselves previewing a sequence over and over as they fine-tune it. (I don't know anyone who doesn't work this way.) Premiere can even render a preview in the background, but this dramatically increases the amount of time it takes the rendering cycle to complete. For example, when I tried previewing a particularly complex scene while using Microsoft Word in the fore-



Partial Control The new Motion Settings dialog box lets you distort movies and adjust the relative locations of key frames along a time line.

ground, Premiere made almost no progress during a 20-minute interval.

Finally, you now have access to a second kind of preview called a snapshot, which adds a full suite of QuickTime playback controls and a few editing tools. Inside the Work Area Snapshot window, you can view specific frame transitions using the frame-by-frame controls. You can then mark a specific frame or insert a splice, either of which will take effect in the Construction window. The snapshot feature enables you to make precise changes that you simply can't do using the standard preview function.

Interface Enhancements

Premiere 3.0's interface enhancements range from the mundane to the dramatic. One example of the former is a revamped Project window that enables you to display imported video clips in various sizes and formats (see "The New Desktop"). You can specify the size and format options from a dialog box or use keyboard equivalents to toggle through the view settings. The feature is hardly revolutionary, but it is useful for organizing your stable of video clips into logical groups.

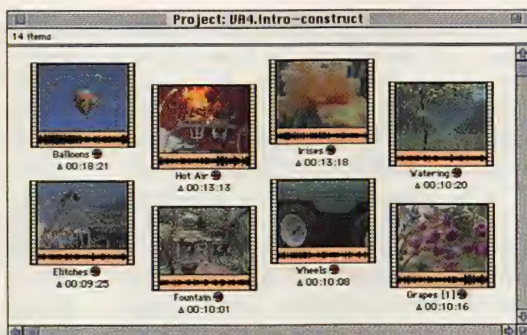
One of my favorite sections of the new Premiere is the enhanced Sequence window, in which you can rough out quick edits. For example, you can combine a couple of clips and save them to a new composite QuickTime movie without recompressing the

clips and further degrading the images. You can even add sounds to movies that you recorded silently using a low-end board like SuperMac's VideoSpigot. If you rely on the Sequence window for storyboarding, you can specify the order of your clips and then transfer all of them in a single drag to the Construction window, where you can then add transitions and other more demanding effects.

In response to special-effects editors VideoFusion and CoSA After Effects, Adobe has enhanced the Motion Settings dialog box to permit gradual transformations and distortions (see "Partial Control"). In addition to rotating and scaling a sequence as it moves inside the frame—functions provided by version 2.0—you can now distort the sequence so that it appears to fly through 3-D space. You can also change the rate at which transformations occur, so that they accelerate or decelerate at key intervals. Granted, Premiere doesn't offer the kind of control you find in CoSA After Effects, but it's a step in the right direction.

To keep up with Apple's Sound Manager 3.0 and QuickTime 1.6.1—both bundled with Premiere—version 3.0 offers support for 16-bit stereo, CD-quality sound. The program also offers device calibration so you can adjust attributes such as hue, contrast, and sharpness during the recording process. Both features are necessary to address the needs of professional digital-video editors.

Premiere 3.0 is so solid and dependable, it ought to be wearing overalls. Certainly, some folks might complain that the program looks a little stodgy compared with the likes of VideoFusion and After Effects. But by the same token, Premiere 3.0 offers by far the more structured, more flexible, and more responsive interface, all of which are ultimately more important to getting the job done. In a nutshell, Premiere remains true to its origins as a video sequencer first and an effects program second. This is one slow-and-steady turtle that will continue to win the race.—DEKE MCCLELLAND



The New Desktop You can now arrange clips in the Project window in any order and at various sizes.

Canvas 3.5

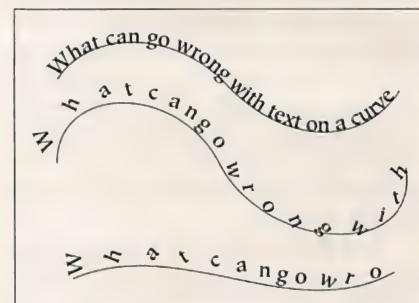
Draw Program

PROS: Envelope feature lets you distort objects inside free-form boundary; composite groups allow you to cut holes in objects; new desktop publishing functions; improved pen tool. **CONS:** Orthogonal extrusion only; several bugs; increasingly sprawling interface. **COMPANY:** Deneba Software (305/596-5644). **LIST PRICE:** \$399.



NO ONE CAN ACCUSE CANVAS OF lying dormant. If the folks at Deneba see a feature that's available in another program, they incorporate it into Canvas. As a result, Canvas looks great on any features-comparison list. Quite honestly, it offers two to three times as many features as competing programs, including Adobe Illustrator and Aldus FreeHand. Some of the features are useful, some aren't, but they multiply like rabbits.

Canvas 3.5 is beefier and bulkier than ever. Having nearly run out of capabilities used in other Mac programs, Canvas 3.5 takes many of its new functions from



Whacked Letters This is what Canvas does to text when you refit it to a path.

an everything-but-the-kitchen-sink program on the Windows platform, called CorelDraw. The Envelope command, for example, allows you to distort selected objects as if they were reflected in a fun-house mirror. As you edit the rectangular boundary—known as the envelope—of a selection, the objects bend and bulge to keep up. By applying envelopes to text blocks, you can create special character effects previously available in Adobe Type Align and Letraset LetraStudio.

Less successful is the extrude function (also found in CorelDraw); it assigns depth to a 2-D shape by extending its sides into the third dimension. Unfortunately, Canvas offers orthogonal extrusion only; there's no way to make the 3-D effect appear in perspective. And the only

way to alter an extrusion is to remove the effect and reapply the Extrude command.

One of the few capabilities of Illustrator and FreeHand that Canvas lacked was compound paths, which let you use one path to cut a hole in another. For example, if you use a small circle to cut a hole in a larger circle, you have a doughnut. Canvas 3.5 now offers this feature in the form of the Group Composite command. After you apply the command to two or more selected objects, all portions of the objects that overlap become transparent, enabling you to see background elements. You can even edit the points and Bézier control-handles of a compound path without ungrouping it.

Version 3.5 now offers small-document design capabilities. As in a desktop publishing package, you can pour text from one column into another. Canvas models its text-overflow tab like the one in PageMaker (but it works in a different way). To automate formatting attributes, Canvas offers style sheets. You can apply a style to a single word or to an entire paragraph. From then on, you simply edit the style to change all affected text.

Canvas has always had problems, but version 3.5 has outright bugs. For example, create a text block, then bind it to a path to create text on a curve. If you don't like the way the type fits, you reshape the path and refit the text. Upon reapplying the Bind Text command to the text, Canvas flings the letters across the path, knocking them on their sides. Happens every time. As a workaround, you can remove the effect and rebind the text, but a bug is still a bug.

And that's not all. When you clone points, you can no longer access their control handles. When you remove an effect created with an Envelope or Extrude command, you can't undo the removal. When you extrude a text block, Canvas unaccountably switches the fill and outline colors. If the text block was first distorted with the Envelope command, the outlines disappear entirely.

Deneba programmers must look at competing packages, and someone says, "You know, we can have this feature up and running in a week." One week later, there it is, tucked into the most unlikely corner of the interface. I, for one, would like fewer bells and whistles, sturdier core functions that I can rely on (like the improved pen tool), and an interface that I can navigate without scrambling for the manual. I hope that in the future someone at Deneba will say, "Let's not add that feature until we get it exactly right and figure out how in the world it will benefit our users." Wouldn't that be something?—DEKE MCCLELLAND

Rae Assist 1.0.2

Personal Information Manager

PROS: Multiple functions in one program; automatic linking of contact and company information; categorizes schedule items. **CONS:** Slow; excessive RAM and disk space requirements; no reminders or repeating events. **COMPANY:** Rae Technology (408/725-2850). **LIST PRICE:** \$199.



ASSIST IS THE NEWEST PERSONAL information manager (PIM) to come to the aid of organizationally impaired Macintosh users. Based on ACI US's 4th Dimension database engine, Assist combines contact management, scheduling, and note taking in an integrated package that is billed as salvation for PowerBook users on the go.

Rae's installer copies Assist and its support files into the System Folder of your start-up drive; the installer also creates a separate folder for Assist's data files, what Rae calls binders. A full installation consumes a hefty 5MB of disk space. Assist is memory-hungry, too, with a suggested RAM allocation of 2500K. The

defined and 5 customizable fields. To accelerate data entry, Assist formats text on the fly—for example, it capitalizes names while you type them. (You can disable automatic formatting by holding down the option key when you tab to the next field.)

An innovative feature automatically links people with the companies they represent. If Assist is unable to locate a reference to a new contact's company, it creates a new company record (see "Contact Entry"). The next time you add someone from that company to the binder, Assist copies all the pertinent information into the contact record for you.

Assist's Planner module lets you book timed events, like meetings, and full-day events, like holidays. The Planner's logical interface includes a helpful assist button that scans the event name and automatically places the event into 1 of 16 categories—for example, "lunch with Joe" goes under food, while "call Joe" gets added to the phone category. Alas, you cannot customize the event types to suit your needs, although you can assign separate user-defined tags to events. The Planner section also lets you enter prioritized to-do items, but the priority levels are limited to A, B, and C.

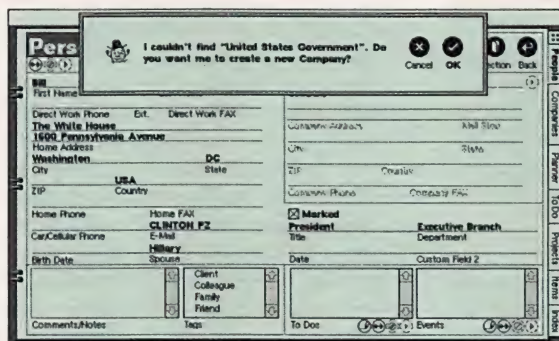
Notably absent from Assist's Planner is support for repeating and multi-day events. Also, the tiny spaces allocated to each day in the monthly calendar view are too small to include event titles or descriptions. Another glaring omission is Assist's lack of a reminder system to notify you when events are coming up.

The Items section lets you enter notes, but you need to export them to a word processor to add formatting. Assist also includes a Projects module

that lets you link people, events, and to-do items together as projects. Linking is Assist's strong suit—you can tie any item in the binder to any other item with a few mouse-clicks.

Ultimately, no PIM is worth much if it cannot serve up information promptly, and this is unfortunately an area where Assist is weak. For example, launching Assist on a PowerBook 170 took almost half a minute, and there was an annoying delay when the program was shuttling from one module to another. So, even though Assist offers its share of fresh ideas, the current version is too big and too slow for me to recommend it.

—FRANKLIN N. TESSLER



Contact Entry You have to enter an address, telephone numbers, and other information for each company in the binder only once.

manual recommends an additional 500K to run in 8-bit color mode, and even more for 16- or 24-bit.

Assist opens in a fixed-size window that is optimized for the PowerBook's screen but does not take advantage of larger or color monitors. Assist's table of contents page itemizes the program's six modules—People, Companies, Planner, To Do, Projects, and Items. To access a module, click on its title or on one of its tabs visible on the right. To provide an overview of the binder's contents, an index function can display a list of any sub-set items that are stored in the binder.

The People module lets you record information about contacts using 17 pre-

Apple Portable StyleWriter

Portable Printer for PowerBook

PROS: Slim, portable design; uses standard StyleWriter ink cartridges; optional sheet-feeder available; good 360-dpi print quality. **CONS:** Slow; muddy gray-scale output. **COMPANY:** Apple Computer (408/996-1010). **LIST PRICE:** \$439.



IF YOU NEED A PRINTER THAT CAN slip in your briefcase, fit on an airplane tray-table or a small desk in a hotel room, and run on batteries, you'll like Apple's sleek new Portable StyleWriter. Less than 2 inches tall and just a bit more than 8.5 by 11 inches in width and depth, the Portable StyleWriter is nearly as unobtrusive as a pair of computer magazines (it is precisely 1.9 by 12.2 by 8.7 inches). Designed to look the part of a PowerBook's twin, the Portable StyleWriter has a slightly rounded front-edge, a gray finish, and six front-panel control buttons. It weighs 4.5 pounds, uses standard StyleWriter ink cartridges, comes with a battery that lasts for about 50 pages before it needs recharging, and includes the same set of 39 TrueType fonts that come with the StyleWriter II.

While not the smallest portable printer available—that honor goes to GCC Technologies' 2.5-pound WriteMove II—for an extra 2 pounds the Portable StyleWriter offers a design that makes it a pleasure to use, whether or not you're on the road. Aligning pages, sometimes a tricky task on tiny printers, is easy with the Portable StyleWriter because its fold-up top cover guides and supports the page. Since you have to manually feed each page, unless you buy Apple's optional 50-page sheet feeder (\$85), you'll appreciate this design feature. For those who are particularly short on space, the

Portable can even print on its side, reducing its space requirements by a few inches. The Portable can also cope with a wide variety of paper types and sizes, including letter, legal, tabloid, A4, B5, transparencies, and envelopes.

The Portable's nickel-cadmium battery delivers about 40 minutes of use, or prints about 50 pages, before the power light starts blinking to warn you that it is running low. Since it takes 10 hours to recharge the battery, you'll need to buy an additional battery (\$59), or bring along the included 1.4-pound power adapter for use in the interim.

Of course, minimizing size and weight usually comes with a few compromises, and the Portable is no exception to this rule. The biggest thing you give up for a sleek profile is performance; in Macworld Lab tests, the Portable was consistently about half the speed of the StyleWriter II (see "StyleWriter Print Speed Comparison"). You also give up gray-scale output quality; the Portable's gray-scale images look muddy next to those from the StyleWriter II, which uses Apple's GrayShare technology to simulate up to 100 shades of gray. The Portable's Canon BJC-10sx ink-jet print engine produces easy-to-read type, but it isn't as sharp as the type produced by the StyleWriter II's Canon bubble-jet-based engine. With all ink-jet printers, of course, the better-quality paper you use, the better your type will look.

Finally, you give up some convenience in using the sleeker printer. Printing envelopes, for instance, which is a bit tricky on the StyleWriter II, requires even more steps on the Portable. You must stand the printer on its side (its vertical orientation), move the paper-thickness-adjustment dial to the envelope icon, insert the envelope through the slot in the back of the printer, then reach around to the front of the printer and press the

LF/FF button and the On Line button, all of which made me feel like I was playing some sort of space-age keyboard device. (It does, however, work.) And if you buy the optional sheet feeder, to use it you have to open the front of the printer, grab a paper clip or some other small, pointed object, and change a tiny DIP-switch setting.

If you don't travel much and are wondering whether the Portable StyleWriter is a better choice than the StyleWriter II for your home or office, pick the slightly larger and heavier StyleWriter II. It costs \$80 less than its portable cousin, you



Apple Portable StyleWriter

can share it over a network, it prints faster than the Portable, it does a better job on gray-scale images, and it produces sharper text. Although its bulky shape makes it hard to pack in your suitcase, the StyleWriter II is a great printer for users with small desks or small budgets. But if you are tired of faxing yourself hard copy from hotel rooms, want to work on printouts during long plane rides, or are equipping the perfect mobile office, the Portable StyleWriter and a PowerBook make a great pair.—LIZA WEIMAN-HANKS



StyleWriter Print Speed Comparison

Best result for each test.
Times are in seconds.
Shorter bars are better.

Multiple Fonts

Speed for a typical 7-page Microsoft Word 5.0 document with a variety of fonts, sizes, and styles.

Courier

Speed for a 20-page Word 5.0 document with double-space 12-point Courier text in plain, bold, and italic.

MacDraw Pro

Speed for a complex drawing with few special effects, but with over 2000 simple objects and several lines of Helvetica text.

FreeHand 3.1

Speed for a complex graphic with special PostScript effects. Our illustration included nonlinear blends and Bézier curves.

PageMaker 5.0

Speed for a 4-page newsletter containing several fonts, a MacPaint image, and 3 gray-scale TIFF images.

TrueType

Speed for a 1-page Word 5.0 document containing 4 TrueType fonts.



All printers were tested using a Mac IIci with a cache card installed, 8MB of RAM, and an internal Quantum 80MB drive.

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Circle 158 on reader service card

Network Software

Network Analyzer Tools

EtherPeek 2.0.3; LocalPeek 2.0.3; TokenPeek 1.0

PROS: Low-cost substitute for external network analyzers; intuitive interface; graphical display of statistics. **CONS:** For AppleTalk, requires dedicated Mac; must reboot if using MacTCP.

COMPANY: AG Group (510/937-7900). **LIST**

PRICE: EtherPeek \$795; LocalPeek \$495; TokenPeek 2.0.3 \$995.



IT'S A SUNNY FRIDAY MORNING AS YOU step into your network administrator office, cheered by the thought of the upcoming weekend. You'll just check your messages... wait, what's this? Stuck to the front of your Mac's monitor are a dozen notes saying *Urgent!* and *Help!* in the frantic scrawl of frustrated users. The network is down. With a sinking heart, you realize that you're likely to be spending the weekend right here, stalking a network fault buried somewhere in the labyrinth of cables and Macs.

If you're a network administrator, this scenario is undoubtedly familiar. It's usually the result of a misconfigured machine or hung server somewhere out there. A sharp network engineer can often identify the problem remotely by using a sophisticated piece of external hardware called a network analyzer. Unfortunately, it takes considerable technical savvy—beyond that of the average administrator—to operate and interpret results from such analyzers.

Luckily, though, Mac network administrators now have alternatives to dedicated network analyzers. A new breed of software running right on your Mac performs all the functions of an external analyzer and has the advantage of a friendly graphic interface. AG Group has a trio of such tools—LocalPeek, EtherPeek, and TokenPeek—that enable you to analyze LocalTalk, Ethernet, and Token Ring networks, respectively. All three products have a consistent user interface and work with any Mac attached to your network.

Each package provides an analyzer program, a set of interface modules for various brands of network hardware, and a library of protocol-specific filters and decoders. (At press time, AG Group

upgraded TokenPeek to version 2.0.3, which adds support for the DCA Mac-Irma card.) Each product also includes a well-written manual explaining installation, setup, and advanced network-analysis techniques. You supply the network hardware for whichever package you're running: LocalTalk (built into every Mac), Ethernet (built into some Macs, or via a NuBus board or SCSI adapter), or Token Ring (via a NuBus board). LocalPeek handles the entire AppleTalk protocol suite, plus SNMP, MacIP, and AURP. EtherPeek adds the TCP/IP protocol suite, plus DECnet, Novell NetWare, Banyan VINES, XNS, and IPTalk. TokenPeek includes all of these, plus IBM SNA protocols.

To use any of the products, you need a dedicated network interface. For Ethernet and Token Ring networks, you can install two network adapters in your Mac, using one for the analyzer and the other for Mac network applications. Macs support only one LocalTalk adapter, though, so LocalPeek requires a dedicated Mac during analysis. All of the products automatically turn off AppleTalk when you start analysis and reenables it when they finish. If you're running TCP/IP via MacTCP, though, you must manually disable TCP/IP and reboot your Mac before starting analysis.

The analyzers work by eavesdropping on network traffic, capturing and categorizing every packet. A powerful filtering facility lets you extract only the packets you're interested in—by protocol,

type, address, or contents. Separate packet decoders let you view the contents of a packet formatted down to the bit level. In addition to the supplied filters, you can make your own based on the contents of any packet field. On a busy network, slower Macs (or those using SCSI Ethernet adapters) may have a hard time keeping up with the traffic. In my tests, though, a Centris 650 had no problems, even on a saturated Ethernet network.

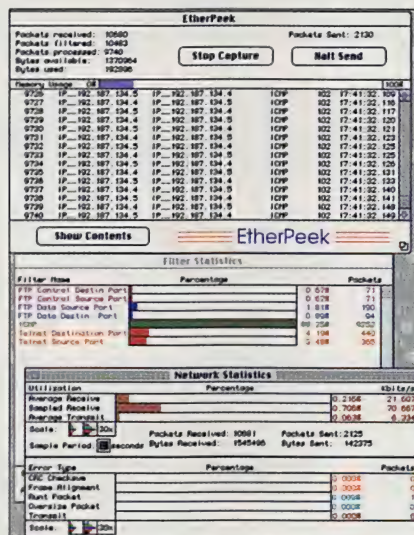
You can capture all traffic, or set a trigger to start and stop capture only when certain events occur—a useful feature for tracking intermittent problems. When a trigger occurs, you can be notified by sound, message, or even radio page (using a third-party paging program). An alarm feature notifies you when network traffic exceeds certain configurable thresholds or when security-sensitive events, such as a new node or protocol, occur.

Sometimes a network becomes sluggish because of runaway traffic caused by a particular application or network node. To track down such problems, you can use statistical analysis. A bar graph lets you monitor the traffic volumes in and out of every node to identify hardware bottlenecks; a similar bar graph lets you track volume by protocol type to identify application bottlenecks. A graphic network-utilization monitor displays overall network efficiency and the rate of collisions and error conditions—information that tells you when you need to replace or upgrade hardware.

Other features include a traffic generator, essential for verifying network configurations and performing stress tests, and various postcapture tools. AG Group also supplies, on request, a stand-alone Helper tool that lets you capture packets to disk on a remote network without an analyzer. You can then analyze the capture file on your system.

Each of the three packages worked well in actual tests, with no problems beyond the minor inconveniences related to particular network types. AG Group deserves kudos for its well-designed, cohesive user interface, which lets you intuitively access the dozens of features available. Priced at a small fraction of the cost of dedicated hardware analyzers, these tools give you better analysis and a friendlier interface.

If you administer a Mac network and find yourself constantly running around putting out fires, you should consider letting a software network analyzer do the running on your behalf. For the money, buying one or more of AG Group's tools will let you relax—and help save those weekends.—MEL BECKMAN



A Peek at EtherPeek You can capture and view individual packets, display traffic patterns by protocol type, and analyze network utilization with the EtherPeek software network analyzer.

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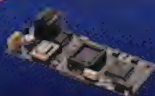


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Circle 132 on reader service card

Apple PowerCD

CD-ROM Drive

PROS: Compact package runs on batteries; extremely versatile; beautiful design. **CONS:** Slow CD-ROM performance; PowerCD desk accessory doesn't provide access to all features.

COMPANY: Apple Computer (408/996-1010). **LIST PRICE:** Approximately \$400 (price is set by retailer).



LAST AUGUST, WHILE THE WORLD'S eyes were on the Newton MessagePad, Apple's Personal Interactive Electronics division also shipped another piece of hardware: the PowerCD, a portable CD-ROM drive that also supports audio CDs and Kodak Photo CDs.

Most of today's CD-ROM drives can access audio CDs and Photo CDs as well as CD-ROMs, but what sets the PowerCD apart is the degree of hardware and software support it provides for audio CDs and Photo CDs. The PowerCD is the first Apple product designed to be as comfortable in an entertainment cabinet as it is next to a Mac. For this, it may be a more significant milestone for Apple than was the Newton.

Next-Generation Design

The compact, 3-pound PowerCD is the same color as a PowerBook, but the family resemblance ends there. The PowerCD celebrates the circularity of a compact disc: its edges are round, its access door is round, its buttons are round. It's a beautiful little gizmo.

The Apple PowerCD is actually a two-piece gizmo: the drive snaps into a base containing a battery chamber, SCSI interface, and SCSI-address switch. The base of the unit holds the drive at a roughly 45-degree angle, making the PowerCD look like a piece of modern sculpture sitting on an easel. A small AC adapter plugs into the base.

The PowerCD's round buttons provide basic playback functions for audio CDs and Photo CDs—the standard play, pause, and stop buttons are here, as are buttons for skipping to the next and previous track (or image, for Photo CDs). For full access to the drive's audio CD and Photo CD skills, you use the remote control included with the PowerCD. Its 38 buttons are logically organized so that, for example, the Photo CD-related buttons don't get in your way when you're working with audio CDs. Apple's skill

at designing easy-to-use system software has translated nicely to remote-control design.

With the remote, you can program the playback order of audio tracks or Photo CD images. But unlike most CD players, the PowerCD lets you store your song or photo playback order—the next time you insert that CD, the PowerCD automatically recalls its program. (You can disable this feature when you want to use a different playback order.) And when you're taping a CD, you can tell the PowerCD how long a cassette you're using, and it automatically stops playback to prevent a song from being cut off at the end of the tape. The PowerCD's 8K of internal memory can hold programs for between roughly 20 and 50 discs, depending on the number of tracks each one contains.

The PowerCD is equally adept at handling Photo CDs. It connects directly to the video-in connector on a television or video recorder. With the remote control, you can zoom in on images, rotate them 90 degrees, program a playback sequence, or edit a program you've already stored. The only other Photo CD playback devices that offer this kind of versatility come from Kodak—and they aren't portable, nor do they support CD-ROMs.

Speaking of CD-ROMs, the PowerCD includes the same basic CD software as Apple's desk-bound CD-ROM drives. With the included Photo CD and QuickTime extensions, you can view Photo CD images on the Mac's screen in slide-show fashion. A separate desk accessory lets you play audio CDs, but doesn't provide access to the PowerCD's track-programming features. Fortunately, you can still use the remote control when the drive is connected to a Mac.



Apple PowerCD

SCOTT PETERSON

Previous-Generation Performance

The PowerCD's audio and Photo CD features are so impressive it's easy to overlook the fact that this is a CD-ROM drive. But it's slow. Because its Philips-built mechanism is designed to conserve battery power, the PowerCD transfers data at the sluggish pace of about 150K per second—about half the speed of today's double-speed drives. Macworld Lab tests show particularly slow performance with text-retrieval CD-ROMs. Apple modified the drive's SCSI interface to boost QuickTime movie and Photo CD playback performance, which are satisfactory.

If you're a serious CD-ROM user, don't buy a PowerCD as your sole drive—it's too slow. (Apple says it plans to address performance in successors to the product, and eventually plans to add features aimed at interactive CD applications.) The PowerCD is best for the person who's looking for a portable drive for occasional CD-ROM use, but mostly wants full-featured audio and Photo CD features for the living room.

In the end, its living-room compatibility is what makes the PowerCD such a milestone for Apple: it represents consumers' first chance to put an Apple logo alongside their stereos and TV sets. Computers and consumer electronics are on a collision course—if the PowerCD is the kind of hardware Apple will bring to this digital demolition derby, I say, put the pedal to the metal.—JIM HEID



How Fast Is the PowerCD?

Products are listed in increasing order of overall performance.

PLAYBACK

Best result for each test.

Speeds are in kilobytes per second.

These tests show how well each drive handles the sustained access needed for continuous playback (for animated presentations and movies).

SEARCH AND RETRIEVE

Times are in seconds. Shorter bars are better.

These tests show how well each drive finds data on a CD and then transfers it to the Mac. Focus on these results if you use multimedia CD-ROMs.

	Data Rate	Video Rate	Search Database	Retrieve Graphics File	Read Interactive CD
PowerCD	150	143	68.1	12.3	94.4
AppleCD 150	149	141	35.7	12.4	68.3
Toshiba XM-3301TA	161	149	32.9	12.3	67.1
Chinon DA-535*	182	300	24.3	7.7	55.6

*Double-speed used for comparison.



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<ul style="list-style-type: none"> • QMS Crown™ technology, featuring multitasking, advanced job spooling, compile-ahead processing, context switching and virtual memory 	Increases print job responsiveness, provides a platform for convenient, cost-effective enhancements and enables peak performance as a network node with interfaces supporting protocols that include EtherTalk™, NetWare® and TCP/IP
<ul style="list-style-type: none"> • Compatible with a variety of languages including PostScript™ Level 2 and Level 1, HP PCL® and HP-GL® • SIO (Simultaneous Interface Option) 	Accommodates the latest application software on all major platforms
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InfoFAX

Please see page 212 for instructions.

upFront 2.0

3-D Modeling Program

PROS: Competent modeling tools; excellent daylighting feature. **CONS:** Steep learning curve.

COMPANY: Alias Research (416/362-9181).

LIST PRICE: \$299.



A CARDINAL BENEFIT OF 3-D MODELING is that it lets you make sense of spatial relationships. upFront 2.0 lets you build models using shaded objects that provide prompt visual feedback, making it well suited for architectural massing studies and the quick analysis of a design. Unfortunately, upFront 2.0 has a steep learning curve. Mastering all its capabilities takes time.

upFront, from Alias Research, is a surface modeler that uses the click-roll-click style of mousing to produce horizontal and vertical planar objects, boxes, cylinders, and spheres. For example, to build walls you set an anchor point, then roll and click the mouse to specify a height and to set subsequent anchor points. Modifying construction sequences or combining tools yields versatile results—for instance, you can use the cylinder tool to lathe objects from wall surfaces.

One of upFront's main strengths is its ability to construct objects perpendicularly to any surface regardless of the tilt or slant of the surface. upFront's new automatic mode selects the surface beneath a tool's cursor as the working surface and assigns the tool a perpendicular height-direction. When you construct and move objects, automatic mode is the default, but you can override the automatic mode by selecting a specific height-direction or object-movement modifier from the tool palette. For example, an object can be constrained to move along the plane of a particular surface. upFront lets you correlate the construction or movement of an object to any line or surface on any object.

A drawback of upFront's click-roll-click operating style is mouse-click inflation. For example, building a cube requires seven clicks, and a move that you accomplish by simply clicking and dragging in other programs requires five actions in upFront.

In addition, examining models can be puzzling. upFront has seven different tools for manipulating the view of the scene—that gives you a lot of control, but it is also confusing. It takes practice to navigate complex scenes effectively, and you never feel like you're inside the model, in the way that you do with *Virtus WalkThrough*. Saved views make traveling around a model more efficient, but upFront is limited to only 12 saved views, which may not be enough in complex models.

A path-animation feature called SpiderVision is new in upFront 2.0. With SpiderVision, wire-frame walls define the path through the scene, the eyepoint of the viewer, and the direction of view. The process resembles building a web around the scene—hence the name.

End lines of a SpiderVision wall define key frames, and upFront tweens the intervening frames. To alter an animation, you can edit the SpiderVision wall using upFront's standard tools, or you can use views of the scene to define key frames. A preview window displays a wire frame of the scene, letting you fine-tune the animation. SpiderVision works well for simple fly-arounds, but it becomes cumbersome when used to traverse a complex scene. Editing the strands of a SpiderVision web is delicate work, and finding the best views for key frames

viously menu selections, have moved to the tool palette where they belong. Dimensional choices have been consolidated in a new Design Settings dialog box that offers more measurement options. A View palette with click-and-drag tools makes three-dimensional navigation more convenient. Finally, a Print Preview dialog box now offers better control of printing options.

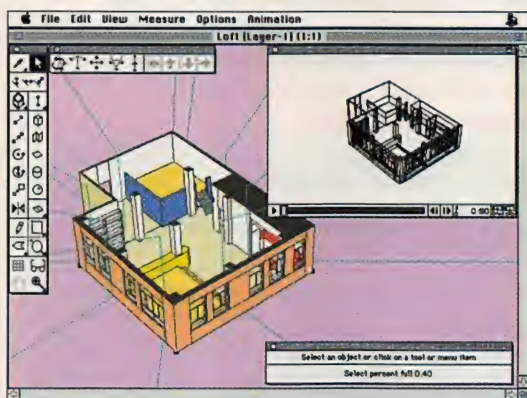
upFront 2.0 renders objects as flat shadings but offers pleasing translucence, transparency, and shadowing effects. The sun is the only light source, but you can position it to simulate any time and place on the globe. upFront generates shadows quickly, and translucent objects produce translucent shadows. upFront can match a model with the perspective and shadow angle of a background photo, and SpiderVision can animate the sun to show the changing play of light and shadows—both of these features are great tools for architects.

For photo-realistic rendering, upFront 2.0 directly exports models to Alias Sketch and produces RIB files for output to Showplace/MacRenderMan. In addition, upFront 2.0 exports 3-D files in DXF (Data Exchange Format), Swivel 3D, and Architrion formats; exports perspective views as editable 2-D geometry in PICT, EPS, and Illustrator formats; and exports bitmapped images in PICT and TIFF. Import options include 2-D PICT, 2-D DXF, and 3-D DXF. upFront can also produce libraries of 3-D objects for recurring use. The program includes a library with more than 100 architectural 3-D clip art objects.

upFront's recommended RAM allocation is 4MB, but, not surprisingly, complex models will demand somewhat larger partitions. Similarly, a fast Macintosh with a math coprocessor improves the calculation of redraws, which can get sluggish with scenes that are larger. upFront's manual is a coherent reference volume with tutorial exercises, but in recognition of upFront's steep learning curve, Alias Research includes a tutorial video and a useful how-to guide, a cookbook for building architectural elements and using program features. The cookbook is a helpful addition that I wish other companies would emulate.

With its own modeling style, upFront 2.0 is something of an acquired taste. However, take the time to learn it and you'll find a capable modeler with useful, if unconventional and demanding, tools. It's not the best choice for graphic artists looking for a 3-D illustration program, but at its new price, it's a good value for architectural modeling.

—CARLOS DOMINGO MARTINEZ



Not Your Average Cobweb upFront's SpiderVision defines animation paths as an editable web—the light blue lines—around and through the model scene.

demands complete familiarity with upFront's view tools. Animations can be recorded in QuickTime, PICS, or RIB (MacRenderMan) format.

Other improvements in upFront 2.0 include a new Mirror tool that quickly duplicates objects, a Cut Solid tool that uses one object to cut another, and an ungroup command that releases grouped objects. The surfaces of walls can now be assigned a thickness, facilitating the construction of structural slabs and walls. The two-dimensional drawing tools, pre-

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Circle 78 on reader service card

Working Watermarker 1.02



Printing Utility

PROS: Prints text or graphics "behind" virtually any document; easy to use; unique product with diverse uses. **CONS:** Limited selection of ready-made watermarks; creating and editing tools are few and available only via a Print dialog box; imports only PICT and EPS files; no way to preview or accurately predict the darkness of a watermark; cannot handle large graphics; cannot download fonts embedded in EPS graphics. **COMPANY:** Working Software (408/423-5696). **LIST PRICE:** \$49.95.



EVERY NOW AND THEN I COME across a utility program that is so simple yet so useful that I wonder why it took so long for someone to think of it. One such program is Working Watermarker by Working Software, a system extension that allows you to print or fax text and/or graphics "watermarks" in the background of virtually any document, and according to the company works with any printer.

Working Watermarker functions by adding a row of buttons and a pop-up menu to any application's Print (or Fax) dialog box. The pop-up menu lists all of the watermark options and allows you to specify whether the watermark you've chosen is to be used for the current print job only or should apply to that plus all subsequent print jobs. You select the desired watermark and frequency setting from the menu and then you print (or fax) as usual. That's all there is to it; your watermark is then printed "behind" the text or graphics of the current document.

Working Watermarker comes with a modest selection of ready-made watermarks, including the always useful imprints *COPY*, *CONFIDENTIAL*, and *URGENT*. By the time you read this, more watermarks will be included, and you'll be able to expand the diversity of pop-up-menu choices by purchasing additional watermark collections from Working Software or Advantage Computing (408/423-5383). Working Watermarker also allows you to create your own watermarks and edit existing ones (although having to edit and create watermarks via buttons in a Print dialog box is inconvenient and counterintuitive—a control panel would be better for these functions and might solve some other problems as well).

There are two miniature pages and a few options and editing controls in the Creating and Editing dialog box (see "Where Do You Want Your Watermark?"). You paste the contents of the Clipboard or import PICT or EPS (but not Paint or TIFF) graphics files into the two miniature pages. You can resize the graphic in the miniature page (stretch a dingbat in a favorite font so it fills the entire page, for example) and center it horizontally or vertically with the click of a position button. Inconveniently, all other graphics editing—including rotating images, combining two or more images, and combining images and text—must be done before the graphic is imported into Working Watermarker.

The Creating and Editing dialog box's darkness control allows you to adjust how light or dark your watermark will print. Settings range from 100 percent (if you want to use the program to print a letterhead in standard text black, for example) to the very subtle 0.1 percent. Darkness settings change in increments as small as 0.1 percent, but the precision this implies is misleading. Different printer models often interpret the same

printer driver) sometimes prints grayscale watermarks more effectively than a 600-dpi LaserWriter Pro 630. Because there is no way to preview a watermark or predict how it will look when printed, experimentation is (for now, anyway) the only reliable way to determine the correct darkness setting.

Watermarks on What?

Working Watermarker works with most programs (according to Working Software), the major exceptions being old versions of Microsoft Excel and Works, WordPerfect (any version), and Aldus PageMaker 5. (By the time you read this, an update that is compatible with WordPerfect and PageMaker 5 should be available.) The manual is blessedly brief; but it is difficult to use and omits some important details, such as the fact that some watermarks disappear at low darkness settings and that large graphics files sometimes either won't load into Working Watermarker or fail to print, with no explanation (the problem is a lack of memory). Be forewarned, as well, that Working Watermarker will not automatically download fonts for text embedded in EPS



Where Do You Want Your Watermark? Depending on whether there is a graphic in one or both miniature pages in Working Watermarker's Creating and Editing dialog box, you can choose from up to four printing options (in the box to the left of the Save button): a first-page watermark only, the same watermark on all pages, one watermark on the first page and a different one on all subsequent pages, or no watermark on the first page and the same watermark on all other pages.

darkness setting differently, and printers vary widely in how light they can actually print a watermark, how smoothly they print gray shades, and how well they render gray-scale graphics at lighter settings. Some QuickDraw printers are capable of only a handful of different gray shades, for example, all of which are pretty grainy. The new generation of 600-dpi printers, on the other hand, can print an extremely wide range of grays, with even the palest grays printing beautifully. The miracle of 600-dpi printers notwithstanding, however, my tests revealed that a 300-dpi LaserWriter IIf (using the LaserWriter 8

files (you must download the fonts manually or include them in your main document as well).

Notwithstanding its imperfections, Working Watermarker has earned itself a permanent spot in my Extensions folder. I have already used it for the predictable *COPY* and *DRAFT* imprints, as well as for tasteful decorative backgrounds on letters, full-page graphics on cover pages, and faxes. I expect to find many more applications in the months ahead, and I look forward to a new version that irons out the program's wrinkles.—ROBERT C. ECKHARDT

F R E E.

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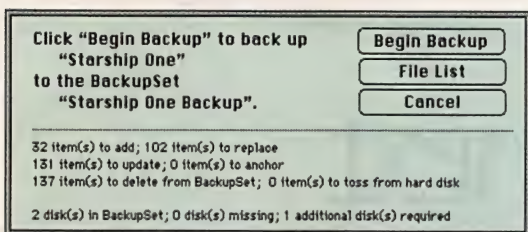
Redux Deluxe 2.0.2

Backup Software

PROS: Fast setup; speedy backups with scheduling option; easy scripting; good technical support. **CONS:** Lacks compression capability; a few interface quirks and minor bugs. **COMPANY:** Inline Software (203/435-4995). **LIST PRICE:** \$79.95.



REDUX DELUXE TRIES TO MAKE the sometimes complex task of backing up your data simple and automatic. You begin by launching the application, choosing Backup, and identifying your source disk and the first backup (target) disk. Redux Deluxe automatically names your backup disk, and it will erase it, too, if you wish. If one disk is enough to contain all your files, you can store the backup in Finder format. This allows you to restore the files without using the application. Otherwise the backup is saved in the program's proprietary format. You can make the backups to any mountable



After the First Backup When Redux Deluxe does an incremental backup, you get a full report of how much data is being added and removed from your backup disk set.

medium (including floppy disk, removable storage device, hard disk, tape, even a network server).

As the backup progresses, a status bar indicates how much of the source disk has been backed up. You can bring another application to the foreground while your backup continues, although performance will suffer.

Subsequent backups are incremental, so only the files that have been changed are backed up. Redux Deluxe's backup scheme will add new files to the backup set, replace the ones that have been updated, and delete the files that have been trashed. If you want to leave deleted files on your backup set, you must open the application's File List and choose the Anchor Deleted Files option (or select the files individually); otherwise they will be removed. This option ought to be available on the opening window, rather than requiring the user to wade

through a long file list and select the files or folders to be anchored.

Redux Deluxe has a neat safety feature. If a backup is interrupted due to a crash or power failure, a copy of the backup script is deposited in the application's folder. If you copy this script to the backup disk, Redux can resume the process exactly where it left off without losing any of the files.

I found that the program has an extraordinary degree of power for such an inexpensive product. The File List allows you to customize your backup. You can add or exclude individual files or entire folders from the backup set, delete files from both your source disk and your backup disks, and even back up multiple copies of the same file. The Filters option gives you a pull-down menu that allows you to restrict your backup choices still further—by name, modification date, type, and creator.

Although Redux Deluxe writes a backup script based on the choices you make, you can write your own, using its plain-English BackTalk language. It allows you to use such phrases as "Check all items that start with M" or "Check all files newer than one week." Scripts can be exported and imported—this makes it possible for other Macintosh users in your office to use the same customized backup routine without setting up the procedure all over again.

The sole important missing feature is a compression option, something that is already available in competing programs. If you don't have enough disks to store your backups on, you need to buy a separate compression utility. Inline's technical-support people say that a compression feature will be offered in a future version of the program.

Although you can set up Redux Deluxe and begin performing routine backups without so much as cracking the manual, executing some of its most powerful features (and a few workarounds that you will need to know) requires reading the book thoroughly. Fortunately, the manual is clear and pleasantly readable, with a nice touch of humor in spots. In addition, technical support for the product is superb.

Redux Deluxe is easy to learn and relatively simple to use—and that's what a good backup program should be.

—GENE STEINBERG

MacPak 1.0

Utility Collection

PROS: Collection includes full AutoDoubler program; nicely implemented program launcher and file-management utility. **CONS:** Uneven quality; buggy DiskLock module; CopyDoubler Lite lacks many of CopyDoubler's best features. **COMPANY:** Symantec/Fifth Generation Systems (504/ 291-7221). **LIST PRICE:** \$149.



THIS COLLECTION OF UTILITIES ISN'T really new; many of the modules are slimmer versions of utilities the company has been selling as stand-alone programs—namely, AutoDoubler, CopyDoubler, Fastback Express, and DiskLock PB. These scaled-down programs have been combined with a handful of miscellaneous desk accessories and repackaged as the \$149 MacPak. The quality of the collection is uneven—some modules are unpolished and buggy—but there's enough here to make it worth the price.

Probably the most valuable component is AutoDoubler Lite—a version of the popular file-compression utility that opens up additional space on your hard drive by automatically compressing documents and applications not in use. The only thing missing from the Lite version is a supplementary utility program to compress items in the System Folder. AutoDoubler expands files automatically (after a slight delay) when they are opened and recompresses them again when they're not in use. You can configure the program to ignore any files you don't want compressed so they're ready for immediate access.

Along with AutoDoubler, you get CopyDoubler Lite, a control panel that handles file copying at least twice as fast as the Finder. It also speeds up file deletion when you empty the Trash. Unfortunately, CopyDoubler Lite lacks some of the best features found in CopyDoubler. It can't copy in the background or queue multiple copy jobs. Also, you can't set sound alerts or set up copies to occur at a designated time. Still, even this crippled version of CopyDoubler is worth having, just for the speed gain.

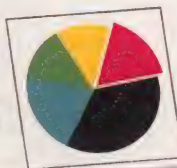
DiskTools is a desk accessory that displays in one window information on all your files and folders. You can also copy and rename files without having to open and close windows in the Finder. DiskTools is an efficient way to manage files, though it has quirks. For example, labels

continues



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Circle 83 on reader service card

applied to files from within DiskTools don't show up in the Finder.

One of the more elegant utilities is Launch Pad. When you install an application in Launch Pad, its icon appears on a tile on the Launch Pad palette. The palette is fully customizable; you can add up to 100 applications. Double-clicking on a tile launches the application. You can set the palette to appear when you drag the pointer to a designated corner of the screen or when you press a key combination. Launch Pad uses 300K of memory, which is not always convenient if you've only got 4MB of RAM.

Not all the MacPak utilities are this impressive. Fastback Express, the backup utility, is disappointing. The program has a clumsy interface and very limited search capabilities (you can't define searches by file-creation dates, for example). There's also no way to either confirm or create a report showing which files you've included in a particular backup set.

In the security department you get DiskLock PB, which lets you password-protect your PowerBook. Despite its name, DiskLock PB works on any Mac running System 7 and equipped with a SCSI hard drive. Though easy to install and set up, DiskLock wouldn't cooperate with my PowerBook Duo 210. When I awoke the Duo from sleep with DiskLock engaged, about half the time I got a totally blank dialog box and nowhere to enter the password—so I was forced to restart. Another quirk is that when you install DiskLock, the program asks for your phone number, and if you go ahead and type in your number, the darn thing displays it whenever somebody tries to start or wake up your computer. According to the company, a new version of DiskLock PB is available on most online services or directly from the company.

Rounding out the collection are two ugly but functional calculators with scientific functions and other mathematical capabilities the standard Apple Calculator desk accessory lacks. There is also a bare-bones calendar program and a handy little 1000-page notepad-and-address-book that nicely replaces the Note Pad that comes with the Mac. This desk accessory, Phone Pad, is resizable and includes automatic phone dialing and a feature that indexes entries for fast retrieval.

Obviously, buying this collection is more economical than purchasing all of these utilities separately, though you probably won't need or want some of them. Still, if you don't already own Auto-Doubler, CopyDoubler, and a good file-management program, you'll get your money's worth from MacPak.

—JOSEPH SCHORR

HP Optical Disk Library 10LC

Storage

PROS: Large storage capacity. **CONS:** Software needs work; security options need to cover device configuration; manual not detailed enough for MIS professionals. **COMPANY:** Hewlett-Packard (800/752-0900). **LIST PRICE:** \$9495.



HAVE YOU EVER LOOKED UP TO the stars and wished for 10 gigabytes of online storage? I have. Jukeboxes like Hewlett-Packard's 10LC, with its 16 optical cartridges, may one day fill that need, but for now its performance is relatively poor and its software lacks the features needed for adequate management.

In general, optical jukeboxes are ideal for large archives holding such items as high-resolution digital images, architectural and engineering drawings, and sound and video samples. Jukeboxes are most effective where a large number of people need files at a moment's notice. Optical jukeboxes are inherently slow, however. For example, the 10LC has only one optical drive inside. Each cartridge must be moved to and from the drive by a robotic shuttle. Swapping disks using the 10LC can take as long as 12 seconds—an eternity in computer time. Reading and writing data are subject to the same performance limitations as on optical drives in general (see "Optical Options," *Macworld*, December 1993). Additionally, jukebox performance depends on the performance of a network and server.

Macworld Lab tested the 10LC using a Centris 650 file server over Ethernet. Tests with large files showed sluggish performance at best. When compared with hard disk servers, the 10LC was 38 percent slower. The same backup to tape was 19 percent faster than backup to the jukebox. However, if you need to regularly access archived data, optical jukeboxes are a better solution than tape archive systems.

Setting up the 10LC is relatively straightforward, as are loading and unloading cartridges. But formatting the cartridges, configuring the software, and copying the data to the optical disks are difficult and time-consuming. And at 40 minutes per surface, formatting 16 cartridges takes a day, so I highly recommend using preformatted cartridges.

Because HP recommends two different software packages for the 10LC, you first have to decide which to use: Jukebox MO from Software Architects (\$895,

206/487-0122) or MacJuke from MacPeak Research (\$1995, 513/327-3211). Jukebox MO has disk caching (a feature that minimizes disk swapping by storing essential volume information on a dedicated hard disk) and a great interface, but it doesn't allow volume spanning (a feature that lets you organize several physical volumes into a single logical volume). MacJuke is exactly the opposite: it has a difficult interface that allows spanning but, as yet, no disk caching. Neither is the perfect solution.

The most time-consuming part of setting up a jukebox is determining how to organize the disks into logical volumes. Simply loading and unloading cartridges can create complications, for example, corrupting a volume's cached data or splitting a spanned volume. Recovering from improper handling could take hours or days. I had tremendous difficulty reconfiguring the jukebox for my tests without reformatting cartridges and caching drives.

Obviously, configuring the jukebox is trickiest for administrators serving a whole office. But even on a desktop Macintosh, Finder updates of volume information incur swaps for every mounted volume. For a 2GB spanned volume, four swaps are necessary. In contrast, Jukebox MO is much more effective because swaps are minimized by caching volume information.

Updating volume information creates delays, but when the jukebox is configured as a server volume, network and server delays are worse. In our tests, Jukebox MO was slow transferring data from the server; with RAM and disk caching on, data transfers were 67 percent faster than with disk caching disabled.

The 10LC's hardware includes the capability for setting a password using the buttons on the front of the jukebox, but the password does not preclude someone from changing configuration parameters (such as the SCSI ID), only from unloading cartridges. The 10LC's manuals are horribly incomplete. You will probably end up calling tech support for even the simplest problems.

If you need daily access to huge files, I recommend that you consider the 10LC or one of its larger cousins (jukeboxes up to 100GB are available from HP and others). For less urgent needs, I suggest you wait until improvements in magneto-optical drives and in management software are incorporated into the jukebox. Then using an optical jukebox will be more practical.—TIM WARNER

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DiskLock PB 1.0

PowerBook Utility

PROS: Fast locking and unlocking; robust security; maintains access log; good documentation; technical support almost always available; money-back guarantee; inexpensive. **CONS:** One password per disk. **COMPANY:** Symantec/Fifth Generation Systems (504/291-7221). **LIST PRICE:** \$59.



THERE ARE MANY SECURITY PACKAGES available (see "Data Guardians," February 1993), but I'm partial to DiskLock PB because it balances robust security with simplicity and ease of use. Designed for PowerBooks, DiskLock PB is a subset of Symantec/Fifth Generation Systems' DiskLock security program, which the company describes as "virtually unbreachable." The main difference is that the full-blown \$189 package also lets you lock folders and encrypt files.

Although marketed as a PowerBook utility, DiskLock PB works on any Mac with a SCSI hard disk running System 7. DiskLock PB can't be installed on floppies or Bernoulli and SyQuest cartridges. Nor can it be used to restrict access to individual soft partitions, but you can lock an entire drive containing soft partitions. DiskLock PB is compatible with file-level compression products, such as Symantec/Fifth Generation's AutoDoubler and Aladdin's StuffIt SpaceSaver, but not driver-level compression products, such as Golden Triangle's TimesTwo or Stac Electronics' Stacker.

Installing DiskLock PB is easy. Copy the application to your hard drive and double-click on its icon. In the dialog box that appears, select the disk you want to protect and click on Install. You are prompted to enter a password (1 to 26 characters). The well-written documentation contains hints for picking one that's hard to guess. You must enter the password twice to safeguard against typing errors. If you have more than one hard drive attached to the Mac, each can have its own password. If the drives share a password, DiskLock unlocks them all if you enter the correct password just once. Unfortunately, each drive can have only one password active at a time, so you and your coworkers can't have separate passwords for use on the same Mac.

Before finishing the installation process, you need to configure the times when DiskLock PB should lock the hard drive: at shutdown, sleep, restart, and/or

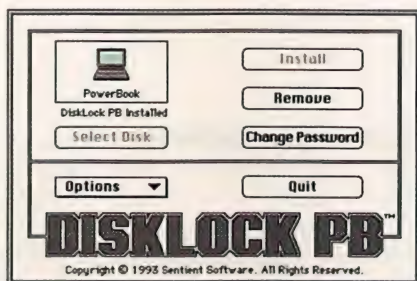
when your PowerBook crashes. You may also specify a lock key (control, shift, option, or ⌘) that forces DiskLock PB to do the opposite of what the defaults specify. For instance, if DiskLock PB is configured to lock the PowerBook whenever you choose Shut Down from the Finder's Special menu, it won't do so if you hold down the lock key when you choose from the menu. This is a convenient way to override the defaults.

Once DiskLock PB is installed, the next time a lock action occurs, the words "DiskLock locking the disk" appear in the menu bar; then the shutdown, sleep, or restart procedure finishes.

The next time anyone turns on or wakes the PowerBook, the hard disk spins up and DiskLock PB immediately presents a dialog box in which the user must enter the password before gaining access. If you don't enter something within 60 seconds, the PowerBook reverts to its prior state, either sleep or shutdown. The same thing happens if you click on Cancel, so you can use DiskLock PB instead of the Airport Shutdown feature in Symantec's Norton Essentials for PowerBook. If you enter three incorrect passwords in a row, DiskLock PB emits a loud buzzing sound and the Mac shuts down or goes to sleep. If you enter the correct password, the program unlocks the disk almost instantly and an alert box notifies you of the time and date of the entry. The Access Log keeps a record of each time the hard disk is locked and unlocked.

Because DiskLock PB patches the driver on the disk, it's much harder to crack than most PowerBook utility packages' security features, which anyone can bypass by booting from a floppy. Although a knowledgeable hacker can subvert virtually all locking schemes, DiskLock PB provides sufficient security to keep out all but the most determined. And DiskLock PB is inexpensive; comes with a one-year money-back guarantee; and has by a knowledgeable tech-support staff available toll-free, 24 hours a day, seven days a week, except on major holidays.

—OWEN W. LINZMAYER



DiskLock's Interface Installing, removing, and configuring DiskLock PB is easy, thanks to its simple interface.

DupLocator 1.03

Disk and File Organizer

PROS: Can modify file attributes to many files at once; good disk-cataloging features. **CONS:** Duplicate finding needs improvement; some memory-management problems; cosmetic bug in the Color menu. **COMPANY:** Midnight Software (303/933-1013). **LIST PRICE:** \$99.



MIDNIGHT SOFTWARE'S DUPLOCATOR is a disk utility designed to find and delete unnecessary, space-wasting duplicate files on one or more volumes on a hard drive, floppy disk, or a network. The program can also perform file-modification commands such as move, rename, copy, and launch files; change file attributes such as color, type, and creator; and create new folders. DupLocator can serialize floppy disks, rename and catalog them, and then print the catalog. DupLocator works reasonably well but needs some improvement.

You open the program to DupLocator's Search and Tool palettes. The Search palette allows you to select a single disk volume to scan and lets you initiate the scan using the Search button. After DupLocator searches the disk, the main window lists all the files that are on the selected disk, and the Tool palette, which has buttons to perform the file commands, becomes active. You can select individual files, or group several files using the Add to Batch command. Files can then be deleted, moved, copied, or given color labels. If you own either Aladdin Systems' StuffIt Deluxe or Symantec/Fifth Generation Systems' DiskDoubler, DupLocator can create compressed archives from one or more files in the main window or in a batch. You can select and scan additional disks, adding their contents to the main window. In the Search palette the program keeps a running total of the number of volumes and files scanned, and the number of duplicate files it finds. You inspect the found duplicates by opening the Duplicate Files list from the program's View menu.

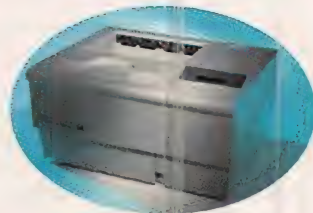
DupLocator does a fair job of locating duplicate files. Unfortunately, it determines that two files are duplicates if they have identical names—occasionally two files with the same name aren't true duplicates. For instance, an alias can have the same name as the original. Another example is CE Software's QuickKeys, which creates a key-set file for each

continues

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application's special macro key set and gives that key-set file the same name as the application. So if you have created a QuickKeys key set for ClarisWorks, the key-set file is named ClarisWorks in the QuickKeys Preferences folder.

When you view duplicate files in DupLocator's main window, you must compare the type, creator, size, and modification date of files flagged as duplicates to decide which ones, if any, should be deleted. When you decide a file is a true duplicate, you add it to a batch and delete it. I'd like to see Midnight Software add some intelligence to the duplicate search. There should also be a preference that allows you to not flag aliases as duplicate files, and you should be able to create a list of the other file types that DupLocator should ignore.

One problem with using DupLocator as a general file utility is that you must always build a list of files on a disk with the program's Search button before you can perform file operations. This is in contrast to other file utilities with many of DupLocator's features, such as Prairie Soft's DiskTop (\$99.95; 515/225-3720). Simply opening one of these programs from the Apple menu presents you with a list of files and folders on the disk, and you can immediately select and perform a file operation. If you already own a file utility that you can use to perform these functions, DupLocator may not give you enough additional usefulness to justify the purchase.

I had a few problems with DupLocator. The list of files from a volume or drive must fit into RAM, so if your Mac has limited RAM, you are limited in the number of files you can search at one time. The default memory allocation under System 7 is 1MB (the program will still run with 512K); 1MB of RAM allows approximately 9000 files in the search list. The maximum number of files the program can handle is 16,380, so if you need to catalog large disk volumes, you should probably not use DupLocator. I experienced repeated crashes when I attempted to catalog a 1GB hard drive that contained over 18,000 files; the program should handle this extreme situation with more grace. Also, there is a bug in the Color menu that causes the color labels to display in black and white, even though the program changes file colors with no problem.

DupLocator is a good general file utility for new Macintosh users. Experienced users most likely have one or more utilities that contain most of the features in DupLocator; if so, DupLocator may not give them enough added utility to justify the cost.—TOM NEGRINO

DriveTech 1.0

Cleaning and Diagnostic Program

PROS: Cleans the floppy drive. **CONS:** Inadequate manual; program has no built-in help to explain error messages. **COMPANY:** MicroMat Computer Systems (415/898-6227). **LIST PRICE:** \$59.95.



DRIVETECH IS DESIGNED TO CLEAN the read-write heads of a floppy drive and diagnose drive problems that require repair. It cleans drives well, but because of poor documentation, it is difficult to understand what the diagnostic features mean.

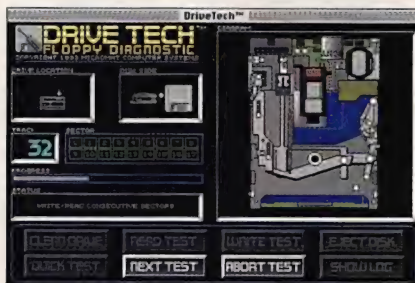
The DriveTech package comes with a 3M cleaning disk and cleaning fluid; the DriveTech application software; and two specially recorded test disks, one for 800K double-sided drives, and one for 1.4MB high-density drives. MicroMat provides replacement test disks (either 1.4MB or 800K) for \$12 and a replacement cleaning kit for \$9.95, plus shipping and handling.

The drive-cleaning features are easy to use. First you moisten the cleaning disk's head-cleaning fabric with six drops of the cleaning fluid. After launching DriveTech, click on the program's icon and insert the cleaning disk. The program then sweeps the read-write heads back and forth across the cleaning fabric for 30 seconds, ejecting the disk when complete. This worked well on several drives from a dirty factory environment; in four out of eight malfunctioning drives, this simple cleaning restored the drives. Two drives responded to a combination of cleaning and liberal squirts of compressed air to blow the gunk out of the drives; the other two drives wouldn't accept disks properly and needed replacement.

DriveTech offers three diagnostic tests. The Write Test uses a formatted scratch disk (not supplied) to write, then verify data to every track and sector on the disk. The Read Test uses the two test disks to check factors such as relative head alignment and read integrity. The Write Test takes 23 minutes to complete; the Read Test takes 12 minutes on a 1.4MB drive and 19 minutes on an 800K drive. The Quick Test uses a subset of the Read Test to quickly verify a drive and takes about a minute to complete.

The main problem with the package isn't the program; it's the manual. The 40-page pamphlet lacks both an index and a table of contents. On the positive side, the manual is easy to read; it's filled with

good illustrations and step-by-step directions on how to use the program. But the manual includes virtually no information on the error messages DriveTech produces when it reports problems with a drive test, leaving you to wonder if the program has found a serious problem. For example, it's possible that a scratched disk will produce error messages that incorrectly indicate drive problems; I scratched a floppy disk's surface with a knife, then formatted the disk successfully in the Finder. That disk then failed DriveTech's Write Test, providing the error message "Unable to Write Diskette; Sector number never found on a track." That error message isn't in the manual; MicroMat's tech support said the message meant that either the disk or the drive was bad. Incredibly helpful information—what else could the problem be, other than the drive or the disk? The manual says that DriveTech's Read Test performs tests for relative head alignment, read integrity, head-to-head integrity, random seek, and maximum seek, but it doesn't define or explain any of these terms.



Application Window This window shows how simple the program is to use. The animated diagram on the right shows you what's happening inside your floppy drive as the program performs its tests.

Tech support was spotty; when I called the support number (not toll-free), I was asked to hang up and call back on another line. The first support rep who answered the phone specialized in another MicroMat product. He tried to be helpful, but he put me on hold repeatedly while he asked other reps for assistance. Finally, he offered to have the DriveTech expert call me back; my call was returned late the next afternoon and my questions were answered satisfactorily.

The idea behind DriveTech is good, and with a bit more effort, MicroMat could have produced a useful floppy-drive maintenance package. But without decent documentation, or clearer error messages, DriveTech doesn't give you enough information. That effectively leaves you with a \$60 floppy-drive cleaning kit, and since you can buy a cleaning kit without software for about \$10, that makes DriveTech a bad deal.—TOM NEGRINO



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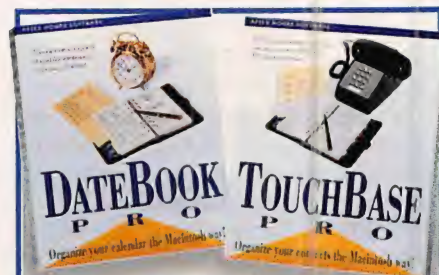
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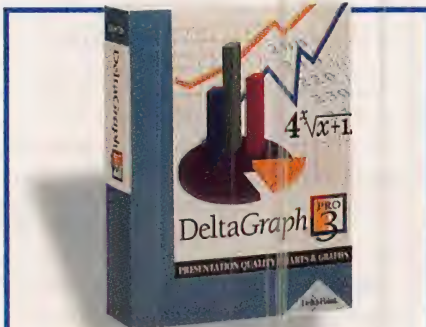
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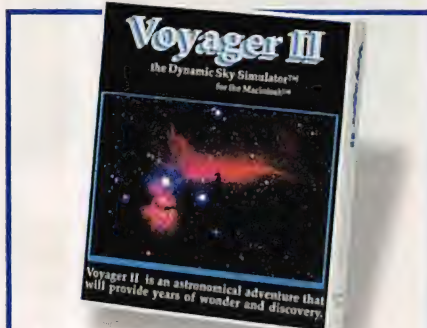
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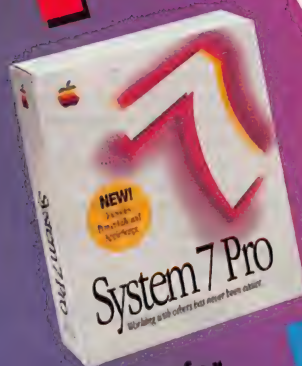
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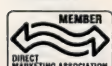


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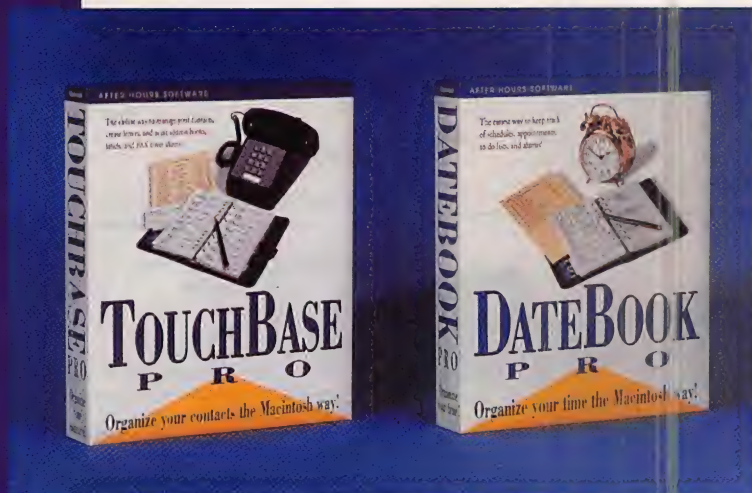
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Tableworks Plus 1.05

Publishing Utility

PROS: Offers much-needed table-creation and -editing facilities to QuarkXPress; fairly easy to use despite complexity. **CONS:** Needs extra memory; can be slow on large tables. **COMPANY:** Npath (206/392-7745). **LIST PRICE:** \$299.



TRYING TO PUBLISH A TABLE ON the Mac has long been a frustrating exercise, since neither of the top publishing programs—Aldus PageMaker and QuarkXPress—offers an appropriate tool for an even remotely complicated table. (Frame Technology's FrameMaker has the table tools but lacks essential design-oriented publishing tools, while Corel Systems' Ventura Publisher has a good set of table tools but is incompatible with System 7.1 and thus most modern Macs.) Look at the tables published in *Macworld*—even these straightforward elements are a production nightmare with both programs. But there is now a solution, at least for QuarkXPress users.

Npath's Tableworks Plus XTension is a major revision of its former Tableworks add-in program. It boasts so much new functionality that Npath rightfully started the numbering again at version 1.0. Essentially, Tableworks Plus adds a full table editor to QuarkXPress 3.1 or later, letting you split, merge, slant, rotate, resize, and edit cells; resize, move,

format the text within a cell as easily as any paragraph. And while you can apply all table formatting through the Tableworks Plus palette, you can use QuarkXPress's Measurements palette to apply character and cell formatting.

Tableworks Plus can also import text-only (ASCII) files created by Microsoft Excel and other tabular-data-creating software and format them into tables. When used with Npath's \$89 XTension TextLinker, it can subscribe to Excel and other data files and publish its tables for use by other System 7 applications.

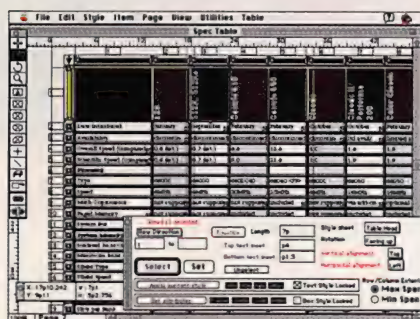
The only omission I noticed is the ability to create a multipage table that breaks horizontally across pages; the multiple option in Tableworks Plus just breaks long tables that are too deep—not those that are too wide—for the current page. (The workaround is to use QuarkXPress's ability to create multipage spreads and put the table on such spreads. That's what I did when I re-created a longer version of a three-page pullout table from "Upgrading Your Mac" in *Macworld's* June 1993 issue.)

Disappointingly, Tableworks Plus's rotation and skew tools are not simple to use. The tools would be more effective if they just changed the angle of boxes and their text, rather than rotate the box around the center point (a limitation in QuarkXPress) as they do now, since that causes difficulties in aligning the contents of rotated cells to their columns. What should be a simple operation takes much trial and error, involving manual resizing of cells and changes to style sheets.

The Tableworks Plus palette and the various table-editing dialog boxes can be daunting, and a little confusing, so expect to experiment until you get a feel for how to navigate the options and use them effectively. The manual covers all the options, but make sure you read it thoroughly. It's serviceable but no more.

If you're working on very large tables, you'll need a lot of memory and some patience: for a table with about 1200 cells, I had to set QuarkXPress's preferred memory size to 5500K, and the time to update after changing attributes was in the tens of seconds per change (the XTension runs best with QuarkXPress 3.2). But that's a result of the table's complexity—the fact that I could create and edit such a table at all is incredible.

All in all, Tableworks Plus is a must-have for anyone doing even mildly complex tables, whether for feature comparisons, price lists, reports, or other such business needs.—GALEN GRUMAN



Professional Table Editor Tableworks Plus gives QuarkXPress sophisticated table-editing abilities with few limitations.

add, and delete rows and columns; and even create multipage tables.

Tableworks is designed to automate much of the table-editing process. For example, you can automatically put color backgrounds of any shade behind alternating rows or columns, and you can specify the number of consecutive rows or columns that are highlighted. Because you can apply a style to each cell, you can

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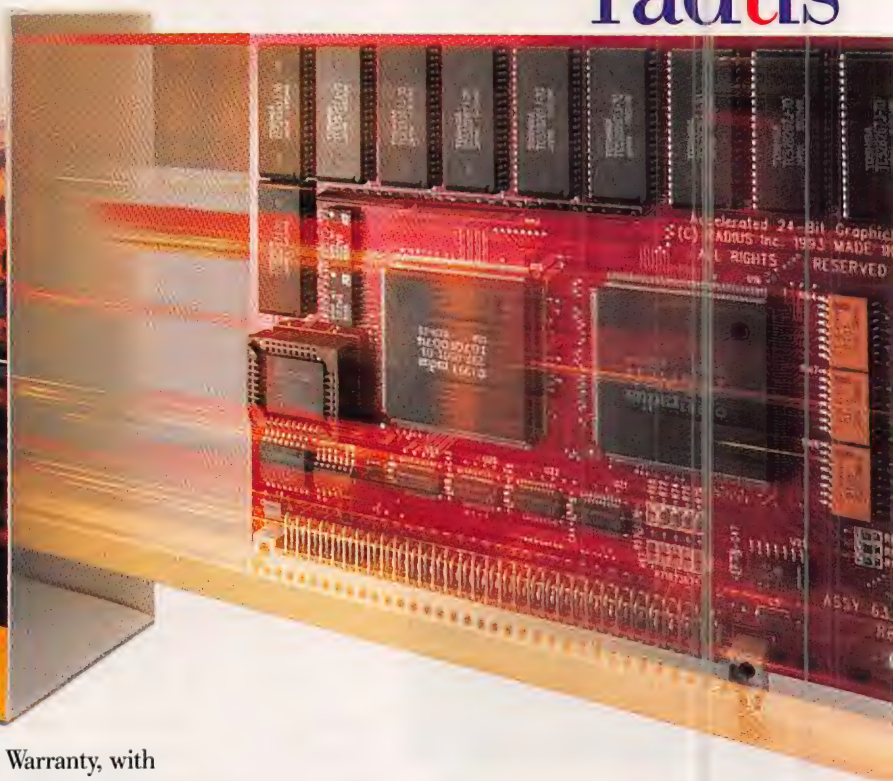
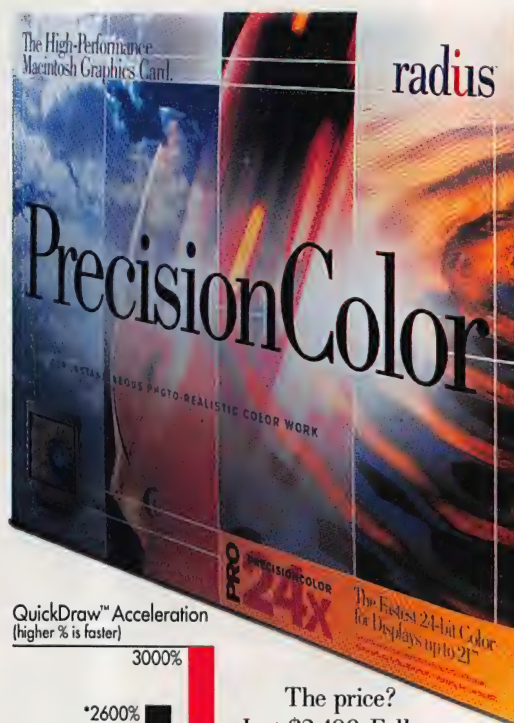
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SEE US AT MACWORLD EXPO BOOTH #507

Mirror 800 Plus Color Scanner

800-dpi Scanner

PROS: Good RGB color reproduction; competitively priced; optional NuBus JPEG compression; well-designed scanning software. **CONS:** Relatively slow scan times; limited to scan sizes up to 8½ by 11½ inches. **COMPANY:** Mirror Technologies (612/633-4450). **LIST PRICE:** \$1299; with JPEG NuBus option \$1599; 35mm transparency add-on \$599.



FINDING A MODERATELY PRICED flatbed color scanner with decent resolution is not as difficult as it was even a year ago, but locating one that includes hardware-based JPEG compression and a 35mm transparency option is much trickier. The Mirror 800 Plus Color Scanner fits this description quite nicely.

Employing three-pass technology, the Mirror scanner produces clean gray-scale, black-and-white, and halftone scans, as well as 8- and 24-bit color scans that boast faithful RGB color values. The optical horizontal resolution is technically 400 dpi, but software and hardware interpolation can bring the resolution up to 800 dpi. At that

resolution, 24-bit files run in the tens of megabytes, so the optional NuBus JPEG board could turn out to be your storage medium's best friend. Happily, image quality for most scans is retained at compression ratios of up to 20:1. Toss in the easy-to-use 35mm-transparency scanning module, and you have a nifty desktop scanning package for just under \$2200.

There are a few negatives in the mix. The Mirror 800 Plus is not a speed demon. It took about four minutes to preview a 6-by-8-inch color photo at 400 dpi, and a little longer than that to scan it; you can nearly double those times for an 800-dpi scan. There are faster competitors on the market. Also, the scanning bed is limited to 8½ by 11½ inches. You can scan larger images in pieces and knit them together later with software, but this will provide little solace to those who regularly deal in legal-size documents.

MirrorScan, the software that ships with the Mirror 800 Plus, is a nicely engineered front end that comes in three varieties: a Photoshop plug-in, a small application for System 7 users, and a desk accessory for those using System 6.0.7 or later. The user preference files are the same for each of these front ends, so you can easily switch

from one to another; you might occasionally want to switch from the memory-hungry Photoshop plug-in, for instance. An OCR extension allows the Mirror scanner to emulate an Apple scanner, allowing text to be deciphered by most of the major OCR packages.

Besides allowing you to choose resolution, bit depth, brightness, contrast, gamma setting, and file format (including EPS, TIFF, PICT, and Clipboard), MirrorScan offers familiar tools—a zoom box, a grabber hand, and an eyedropper. The last one is particularly handy for setting white limits; all pixels lighter than the one under the dropper become white.

Installing the Mirror Slide Kit is a bit tricky, requiring a surprising degree of force, but it works smoothly once connected. All in all, the Mirror 800 Plus performs a number of scanning tasks quite nicely.

The optional JPEG NuBus board and MirrorQuick software replace QuickTime's Photo-JPEG software routines; because the Mirror package is hardware-based, it can compress images much more quickly than Apple's software-only option, ten times faster in many cases. The best news of all is that images compressed with MirrorQuick can be opened in any QuickTime-savvy application. The only caveat: Don't try JPEG compression with less than 8MB of memory.—SUZANNE STEFANAC

VersaTerm 5.0

Network Terminal-Emulation Package

PROS: Comprehensive feature set; good performance; includes Internet TCP/IP connection kit; supports multiple simultaneous connections.

CONS: Only one emulation session visible at a time; lacks Zmodem protocol; complex documentation. **COMPANY:** Synergy Software (215/779-0522). **LIST PRICE:** \$195; Pro version (4105 emulation) \$295.



INTERNET, THE PUBLICLY SUBSIDIZED world-spanning network including millions of users, has become suddenly popular with individual computer users. Through Internet you can participate in discussion groups on every imaginable topic, download free software and other information, access public databases, and even send E-mail to the White House. Unfortunately, while academic and industry folks often have free Internet access, private Macintosh users wanting to connect with Internet find the process complicated, tedious, and expensive. Synergy Software's recent VersaTerm upgrade bundles a good terminal emulator with the basic tools you need to become a

network traveler, at less than half the price of competing products.

The basic package includes the VersaTerm emulator and a package of Internet utilities collectively called Versatilities, which also contains Apple's MacTCP 2.0.2 networking software. Another \$100 will get you the Pro edition, which adds IBM 4105 color emulation and is useful to IBM mainframe users. Three well-written, hefty manuals detail all of this. Missing from the documentation is any kind of road map telling you where to begin; a "getting started" pamphlet would make installation less daunting.

The VersaTerm terminal-emulator component has a sophisticated feature set, encompassing VT220/VT100, Tek4014, and D200 terminal types in both text and color graphics. The keyboard emulations support DEC, IBM, and DG layouts, as well as Unix vi and emacs text editors and user-defined macros. The file-transfer protocols include Xmodem, Ymodem, Kermit, and TCP FTP. Strangely enough, VersaTerm lacks Zmodem support, even though this protocol is among the most popular for serial transfer. VersaTerm supports multiple simultaneous connections over serial lines, or via AppleTalk or TCP/IP networks. A server feature gives VersaTerm users on an AppleTalk network access to other networks through a gateway

Mac. The emulation is fast, able to keep up even on high-speed Ethernet connections. However, VersaTerm lets you view only one network connection at a time, even when several are active, which is not very convenient.

As good as VersaTerm's emulation is, the included Versatilities collection of Internet tools is where the package really shines. This eclectic package contains Internet connectivity components that until now have been difficult or expensive to obtain: MacTCP 2.0.2 (the latest version, which works with System 7.1); a SLIP (Serial Line IP) connection tool; and VersaTerm-Link, an integrated set of Internet clients for Usenet news, E-mail, directory services, and file transfer. MacTCP is an Apple-developed extension supporting the TCP/IP protocol used by Internet. SLIP lets you establish a dial-up TCP/IP connection through one of many commercial Internet providers, offering an inexpensive way for individuals to have a full presence on the net. And the client tools in VersaTerm-Link let you get in on the ground floor of Internet services: Usenet news groups, private E-mail, and public file archives.

VersaTerm's price and feature set make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it.—MEL BECKMAN

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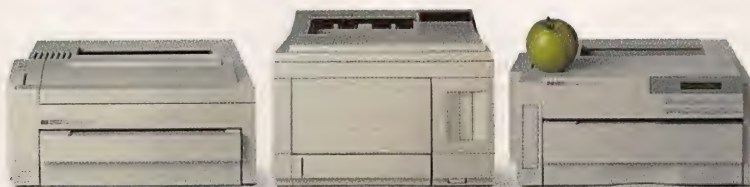
Choose from 300- or 600-dpi print quality, and prices ranging from \$1,279 to \$2,399. Setup is easy. And with built-in PostScript™ Level 2 software from Adobe, you'll be ready to roll with the latest features in Mac printing. LocalTalk means built-in Mac compatibility.

And a RISC processor means fast printing from start to finish.

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When you choose HP LaserJet, you'll have a printer with a legendary reputation. For quality. And reliability. For more information call 1-800-LASERJET, Ext. 7685!

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it's only a laser printer.**



QC Tools 1.0

Statistics Tool Kit

PROS: Good assortment of tests; prepared templates can be used with minimal training. **CONS:** Requires StatView 4.01; installation is annoying. **COMPANY:** Abacus Concepts (510/540-1949). **LIST PRICE:** \$245.

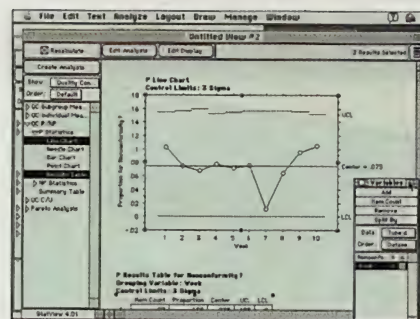


STATVIEW HAS LONG BEEN A BEST-selling Mac statistics program, and Abacus Concepts has been faced with developing a rational strategy for expanding it. Rather than grow the program into a 20MB giant like SPSS, Abacus decided to offer extensions (quality control, specialty ANOVA features, 3-D graphics) to its core statistics as independent modules. StatView (see *Reviews* and "The Statistical Difference," *Macworld*, October 1993) has been restructured to accept add-in code, and QC Tools is the first such add-in product.

The main theme in quality-control analysis is process monitoring, which means defining parameters to specify when a product is acceptable or not acceptable. Special charts and tests have been developed for this purpose, and QC Tools includes most of

them. Subgroup-mean (Xbar) charts, subgroup-range and standard-deviation (R and S) charts, and cumulative-sum charts are provided on templates that combine charts with prepared tables—for example, for capability indexes. There are analogous templates for individual measurement statistics, for p/nP counting methods (proportion and number defective), c/u statistics on subgroups (for countable attribute defects), and Pareto analyses for suggesting process improvements. Once installed, the types of analysis simply appear in the scrolling analysis list on the left side of the StatView screen, and each analysis takes place in the context of a StatView QC template. This makes it easy to get started (QC Tools offers a respectable set of samples for practice) and easy to make an impressive set of slides or overheads using StatView's presentation tools. If you can get your process data into a spreadsheet file, you can import it to StatView QC Tools and let the program itself suggest the analysis. It's ironic that 1993 has finally seen this slick Mac implementation of QC statistical methods (many described in the 1950s Western Electric handbook); but, as with corporate America's reawakening of interest in quality control, better late than never.

The business of quality-control statistics is sufficiently specialized that QC Tools really warrants, even at \$245 or so,



In the Zone This graphical analysis of product defects in a manufacturing system is one of a series of easy-to-use templates available in QC Tools.

an additional stand-alone version; while the SYSTAT environment provides some quality-control features, SYSTAT and Data Desk users really need QC Tools. Abacus could also improve things by believing that customers in this market know whether they have an FPU and version 4.01 or not, and redesigning the installation accordingly. Though QC Tools appears to introduce a slight slowdown in program response, generally the product is well designed, well documented, and suitable for quality-control neophytes and professionals as well. And since QC Tools costs a mere \$100 if purchased with StatView 4.01, every industrial user of StatView can certainly justify owning a copy. —CHARLES SEITER

AboutFace 1.1.1

Type-Specimen Generator

PROS: Helpful keyboard map printout. **CONS:** Many errors and omissions in manual; type-specimen printout is flawed. **COMPANY:** Big Rock Software (716/288-2860). **LIST PRICE:** Version 1.1.2 \$69.95.



IF ABOUTFACE WERE BILLED AS A collection of puzzles, it might be a good buy. But it's meant to be a utility that provides information about your installed fonts and prints out type-specimen sheets. Alas, its meager documentation leaves the reader guessing what to do next.

Let's start by opening up the program. The manual says the Specimen page appears when you open the application. Mine opened to the StyleFinder page, but no matter; the manual states that I can choose another viewing option by selecting New from the File menu. But the New menu option is grayed, since, it turns out, AboutFace can open only one window at a time. You don't have to be a genius to figure out that the current document must be closed before a new one can be opened, but a good

manual should point this out for the benefit of novice Macintosh users.

Once you figure out how to navigate the program, you'll see that it offers five formats for printing font information. The Specimen page displays the currently selected font's upper- and lowercase letters, numbers, punctuation marks, and miscellaneous characters. It also displays three blocks of text in 8-point, 10-point, and 12-point sizes. Unfortunately, the text blocks are set solid (no extra leading), a format that few typesetters use unless they're trying to cram a lot of text into a small space. Worse, the lines of text are a good 4½ inches wide, which in 8-point type looks quite awkward; a reader's eye balks at scanning long strings of words. Finally, there's an extra space between two of the words in the sample text, making it difficult to judge the overall tone or perceived shade of gray of a block of text.

A second format is the Character Set page, which prints all the characters in a given font at 48-point. Or perhaps it's 44-point. The manual says 48, while the screen display says 44.

The Keyboard Map is useful, printing a chart of the characters produced by each key on the keyboard, including shift, option, and shift-option combinations. This printout is especially helpful for pictorial fonts.

The Headliner page prints the letters and numbers for several fonts on the same

page. The trick is figuring out how to select more than one font at a time from the list of installed fonts. If you solve the first part of the puzzle and select Print Fonts from the File menu, you still have to figure out how to select multiple fonts from the scrolling list. The documentation for Print Fonts says: "Command to select multiple fonts for printing." What the company meant to say was, "To print multiple fonts, hold down the command key (⌘) as you click on each font you wish to select; if you select a font by mistake, click on the name again to deselect it."

The rationale for the StyleFinder page escapes me. You enter text in a blank window, and the text appears in the font, size, and style you select. You could do that in a word processor.

You've probably deduced by now that I don't like this program much. I'm sorry, Big Rock Software, to be so brutal in my assessment (I feel as if I'd just blasted a butterfly with a howitzer), but the program has many serious deficiencies that need to be addressed. If you're looking for a type-specimen printing program, I suggest Agfa TypeChart from the Agfa Division of Miles Inc. (508/658-5600, \$99); Spectacular from FontHaus (203/846-3087, \$79.95); or The TypeBook, a public-domain program by Jim Lewis available from online services. —ERFERT FENTON

WHERE WERE YOU THE LAST TIME NORTON UPDATED THEIR SOFTWARE?

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It's been a long time since Norton Utilities really improved its software for the Mac. Too long. Now Central Point Software introduces a newer, faster, smarter Mac utility—new MacTools 3.0. How much smarter is it? It retrieves accidentally trashed files in one step. (With Norton, it takes seventeen.) It continuously checks for disk corruption in the background, so small problems don't become disasters. (Norton doesn't.) MacTools 3.0 also finds and fixes Desktop file damage. (Norton can't.) And unlike Norton, it includes complete anti-virus protection, with network support. But that's just scratching the surface. For a detailed comparison of MacTools 3.0 vs. Norton, call FAXBACK at 1-800-847-8766 and ask for document 97532. For all upgrades, just call 1-800-277-3873. And stop living in the past.

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CENTRAL POINT

Circle 93 on reader service card

The Rosetta Stone

Foreign-Language Education

PROS: Good lessons; variable teaching methods; beautiful photographs. **CONS:** Confusing interface; no online help. **COMPANY:** Fairfield Language Technologies (703/432-6166).

LIST PRICE: Each language version \$395.



I SPEAK SPANISH, BUT MY OTHER FOREIGN-language skills are limited to cryptic or obscure phrases and *Scusi, c'è una farmacia qui vicino?*, which might find me a nearby pharmacy in Italy but won't get me much further. In a quest to be multilingual, I looked to Fairfield Language Technologies' CD-ROM education series, The Rosetta Stone Language Library. My evaluation of the products is based on the Spanish version's accuracy and the French version's helpfulness.

The series combines excellent teaching methods with good, helpful material. Each language version has 8 sections for a total of 90 chapters, and each chapter has several questions. The questions get more difficult as the chapter progresses. In the first screen, you might learn the difference

between *la niña* and *las niñas*, and in a few screens *las niñas* (the girls) would be doing something that taught you new vocabulary. The Rosetta Stone teaches both vocabulary and grammar, and its content is generally excellent and diverse. The lessons are well paced and could help both beginning and advanced students.

There are 12 different teaching methods, each offering a different combination of pictures, text, and spoken words. For example, you can hear a spoken phrase and then select which of four text displays correspond, or you can match a picture to one of four written descriptions. You can also record your answers and compare your pronunciation with The Rosetta Stone's, though I did not test this feature.

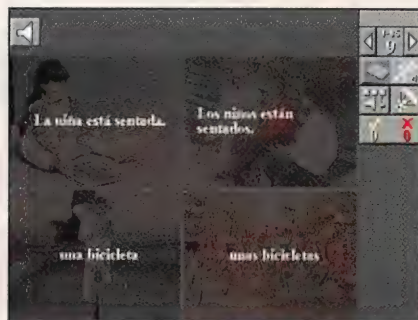
The Rosetta Stone's most serious problem is its interface, which is hard to learn to navigate. There are no \mathbb{A} -key equivalents for mouse-driven functions. All the options are indicated by graphics rather than text. While the product is therefore useful to speakers of any language, I sometimes longed for some straightforward help in a language I knew. What looks like balloon help is actually just a display of credits, and there is no other online help.

The Rosetta Stone's preferences command won't let you turn sound off completely, and the program changes your system's Sound control panel without re-

setting it. The product requires 2700K of RAM and 8-bit color. I tested it on a Mac IICI, using an AppleCD 300 at the Faster setting, and it was fairly slow, though its speed improved when I copied the application to my hard drive.

Each version of The Rosetta Stone comes with a book that corresponds to the lesson plan. The book has exercises and a handy word index. The documentation and technical support were helpful.

I learned a lot from both the Spanish and French versions. At \$395 The Rosetta Stone is fairly expensive, but depending on your level of interest, it may be worth it. Aside from its quirky interface, The Rosetta Stone is a valuable educational tool and fun to use.—JOANNA PEARLSTEIN



¿Hablas Español? This Rosetta Stone lesson teaches singular and plural nouns and verbs.

Visualization of Natural Phenomena

Scientific Visualization Software

PROS: Encyclopedic CD-ROM of scientific visualization examples; covers all disciplines; definitive analysis of methods. **CONS:** Needs CD files of sample code. **COMPANY:** Telos/Springer Verlag (408/249-9314). **LIST PRICE:** \$59.95.



EVERY TIME A NEW IMAGE TECHNOLOGY appears, it takes several years before people learn to exploit it effectively. A particularly embarrassing example is the flood of meretricious "computer art" that poured forth when the first wave of Adobe Photoshop users found that they could false-colorize scanned pictures with a few mouse-clicks. In science the situation has been different. Techniques first used to visualize data transmitted from space or computed at supercomputer centers, with an accompanying rational methodology, have now been put into the hands of any researcher with a color Mac, expanding the visualization user base by a factor of 10,000.

There has been no similar explosion of explanatory material, however, other than fairly brisk explanations in the manuals of

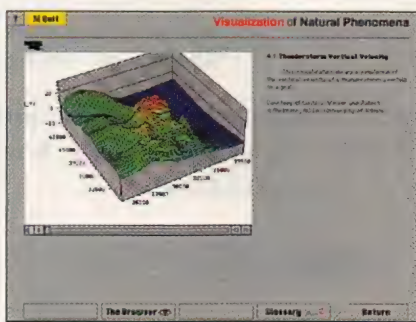
Spyglass products. Now a definitive introduction to applying all aspects of computer graphics to scientific imaging has arrived. Visualization of Natural Phenomena (VNP), developed by Robert Wolff and Larry Yeager of Apple's Advanced Technology Group, is a huge CD of visualization examples, principally as QuickTime movies, accompanied by nearly 400 pages of meticulous description of every scientific visualization trick currently known to humans.

The book accompanying the CD consists of two parts, an overview of visualization history and techniques and 15 techni-


cal notes on the details of image processing. Besides the expected information about color tables and data scaling (see "Now You See It"), VNP covers 3-D animation, volume visualization, rendering, and modeling, and offers an entertaining explanation of the use of the same techniques in film and movies. But the real payoff in VNP is the set of notes that shows in detail how to do image convolutions, compute optimal color palettes, run computations on networks, introduce 3-D perspective, analyze sound, do ray tracing and volume rendering, and calculate shading and illumination on rendered models. No other source covers this much material, at this level of clarity. The examples range from astrophysics to medical imaging, and the CD illustrates each computational lesson.

One addition that would strengthen this CD would be code examples in C illustrating filters, masks, and other image processing techniques. Plenty of this material is in the public domain, and a large fraction of the users of VNP are scientists with enough programming background to know what to do with it. This is a minor problem, however. VNP is a great product, practically a public service, and a bargain besides. Perhaps some scientists will even improve the state of computer art by lending their copies of VNP to artist friends.

—CHARLES SEITER



Now You See It This simple example from VNP of color-palette manipulation represents 2-D visualization of 3-D data.



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For Your Information.

Circle 69 on reader service card

How Computers Work

CD-ROM Tutorial

PROS: Graceful, well-integrated interface; brief but helpful explanations of basic computer technologies. **CONS:** Requires a color Macintosh with a 13-inch or larger screen and a minimum of 4MB of RAM (8MB of RAM is preferred). **COMPANY:** Time Warner Interactive Group (818/955-9999). **LIST PRICE:** \$79.99.



HAPPILY FOR MOST OF US, WE don't need to fully fathom the ins and outs of bits, bytes, and teraflops to operate a computer. Still, there is a sense of surety that grows from knowing more about your computer. If there's no time in your schedule for picking up a quick electrical engineering degree, perhaps a few hours spent navigating *How Computers Work* will provide just the background you're after.

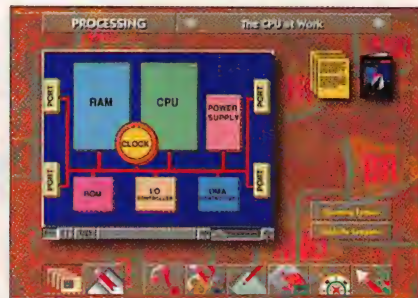
Based on the two Time-Life Books series *Understanding Computers* and *How Things Work*, the CD-ROM tutorial guides the curious through the rudiments of binary numbers, logic gates, and massively parallel processing. As with most CD-ROM products, you choose your path through

a dense data maze. An animated introduction suggests a route, but alternate choices beckon at each digital juncture.

The main screen, or Program Map, offers broad choices—Input, Processing, Memory and Storage, Output, Programming, Applications, and Timeline. Click the mouse on any button, and you launch into a narrated sequence illustrated with dissolving stills and QuickTime animations. A smattering of text-based sidebars add pockets of depth. Icons providing links to related topics appear and dissolve as the presentation unfolds.

An activity area invites you to add a few binary numbers, explore an ASCII landscape, or program a digital "turtle" to do your bidding. Available in the same menu are demo versions of Microsoft Word 5.0 and Excel 4.0, Claris's FileMaker Pro 1.0, QuarkXPress 3.1, Aldus SuperPaint 3.0, and Opcode Systems' AudioShop.

Grazing the Timeline, one easily moves from the abacus through Babbage to nanotechnology and molecular computers. In one of the longest sequences on the CD-ROM—the wildly animated dissolution of the Job character at the end of the movie *Lawnmower Man*—computer graphics meld the possible with the improbable.



Graceful Navigation Beneath each information window is a palette of buttons—including a bookmark, help, glossary, notebook, search, and return.

The overall implementation of the CD-ROM primer is graceful, and the lag times one is forced to endure while waiting for data to travel over the SCSI cable are less painful than those imposed by some of many current titles. Because of the breadth of information covered in this CD-ROM, the degree to which any single topic is explored is necessarily limited, but *How Computers Work* does provide the diligent with a workable overview of the technologies that drive the machines. I did regret, however, that text versions of the narrated sequences are not available for on-screen review and printing. Some of us still retain information best when we are presented with old-fashioned linear data.—SUZANNE STEFANAC

Hell Cab 1.0.2

CD-ROM Interactive Adventure

PROS: High-quality artwork and animation; multiple paths to solution. **CONS:** Slow; arcade sections hard to control. **COMPANY:** Time Warner Interactive Group (818/955-9999). **LIST PRICE:** \$99.99.



TAKE A DIABOLICAL NEW YORK CAB-bie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got the basic recipe for *Hell Cab*, an interactive adventure from Time Warner Interactive Group.

Your journey begins at the front door of New York's Kennedy Airport facing one of *Hell Cab*'s ubiquitous ATMs. (Although accessing the ATM is amusing once, the exercise grows tiresome on subsequent visits.) Cash in hand, you're ready to enter Raul's taxi idling at curbside.

Meeting *Hell Cab*'s challenge depends on paying the cab fare before you die. Otherwise you lose your soul and get sent to you-know-where in a handbasket. (Mercifully, you can save the game at any time and pick it up again later.) A click on the

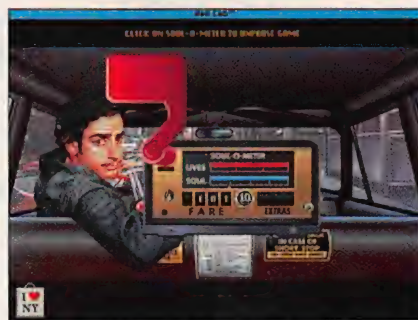
meter at the bottom of the screen shows the number of lives and amount of soul you have remaining and displays the current fare. It's not always obvious which actions will maintain your soul and which ones will speed your descent to the netherworld.

At your first stop, you're free to explore New York's landmark Empire State Building. After wandering the ground-floor corridors for a while, you may decide to ride up to the 86th-floor observation level. The deck offers a panoramic view of New York and even comes equipped with coin-operated telescopes that let you examine the city more closely. When you're done playing voyeur, it's time to drop down to street level and get into the cab. Back in the passengers' seat, you're ready to begin the wild part of your taxi ride with Raul as your guide.

Without disclosing any classified secrets, I can tell you that the trip involves traveling through time to places ranging from the Roman Coliseum during Nero's reign to a prehistoric rain forest complete with dinosaurs and, you guessed it, more ATMs. Navigating *Hell Cab*'s scenarios is fairly intuitive—you simply click in the direction you want to go, guided by the appearance of the cursor. Unfortunately, it sometimes takes a long time for the screen to redraw between moves. The speedier your CD-ROM drive, the smoother the game plays. I found performance less than

ideal on a Mac IIx equipped with a double-speed AppleCD 300.

Much of your time in *Hell Cab* is spent groping around for objects to pick up. Often, the only clue that you're pointing at something significant is a change in the cursor's shape, and the few arcade-style challenges (like hand-to-hand combat) can be frustrating to control using the mouse. On the plus side, the artwork and animations are top-notch. For the most part, the sound quality is admirable, although I had trouble understanding some of the characters, and the musical selections cut off abruptly at times. Overall, *Hell Cab* succeeds—I found it engaging and entertaining, although I would have preferred additional challenging puzzles to solve.—FRANKLIN N. TESSLER



I ♥ NY Clicking on the shopping bag in the lower left corner of the screen displays your inventory.

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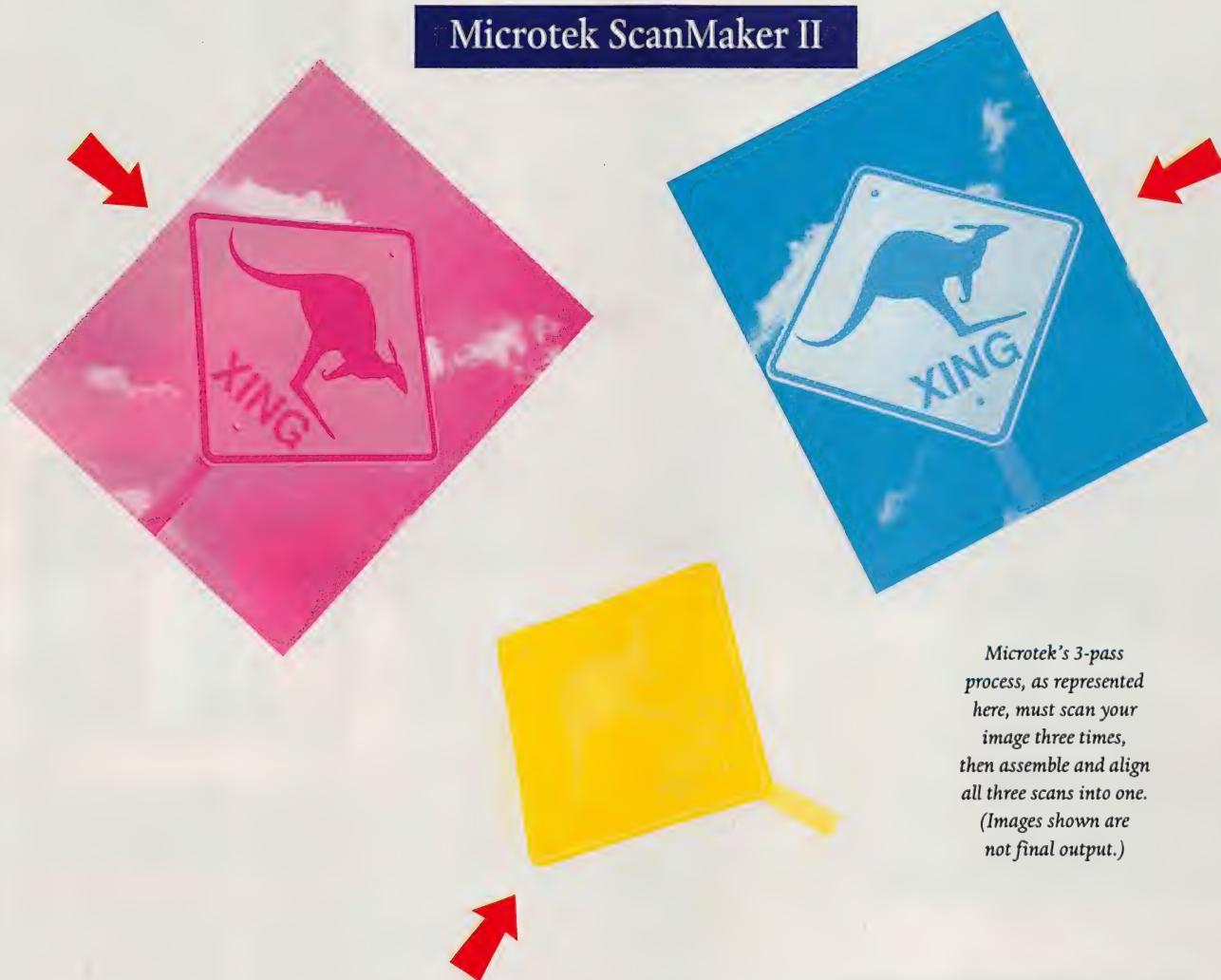
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resolution, it gives you picture perfect results in one simple pass. Precisely
adjusting your image is easy, too, thanks to Epson's unique built-in controls.

With Microtek's 3-pass scanning, image assembly is required.

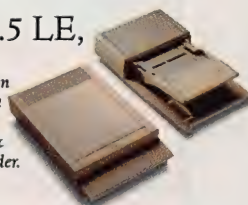
Microtek ScanMaker II



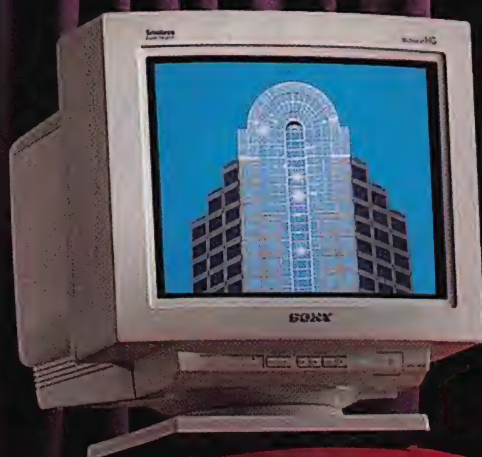
Microtek's 3-pass process, as represented here, must scan your image three times, then assemble and align all three scans into one. (Images shown are not final output.)

What's more, the ActionScanning System comes with everything you need to be a scanning expert right out of the box, including Adobe Photoshop 2.5 LE, one of the most versatile image editing programs around. For our free booklet on scanning or to learn more about the easy-to-use ActionScanning System or our other scanners for Macintosh and PCs, call the Epson Connection at **1-800-BUY-EPSON** (800-289-3776). This is one scanner you should jump at the chance to own.

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Top to bottom: Sony CPD-1430, Nanao FlexScan E340i-W, and NEC MultiSync 4FG.

Small Wonders

MACWORLD LAB FINDS BIG VALUE IN 14-INCH AND 15-INCH MONITORS



BY BOB WEIBEL

Low-cost Macs like the LC III, Performa, and Centris are whetting users' appetites for similarly inexpensive color displays. But price isn't the only reason to consider the bevy of 14- and 15-inch monitors Macworld Lab tested.

In addition to being affordable, these monitors produce a high-quality image. The richness of the color as well as the sharp focus of many of these displays make them ideal for working with graphics and retouching photos, as well as for video-based projects. In addition, some of these monitors include audio jacks to enhance multimedia applications.

And consider these other issues:

- If you're on a tight home or office budget, these low-priced displays may be your only option. They are great entry-level displays, perfect for getting started with a basic, functioning Mac.
- If you are buying Macs in large, corporate quantities, these monitors will serve both Macs and PCs, simplifying your purchasing and support. Should you decide at a later date to get a larger display for one of your Macs, for example, the smaller display will find continued value hooked to a PC.
- Many users are purchasing these monitors. According to Dataquest (a technology market-research firm based in San Jose, California), over 20 million 14- and 15-inch monitors were sold worldwide in 1992. The firm estimates that almost 4 million 15-inch monitors will have been sold by the end of 1993.

Still, some users may be chomping at the bit for 16-inch displays. The bigger the space, the higher the productivity, right? Not necessarily. With all of the capabilities available at 14- and 15-inches, you really have to consider if the extra real estate in a 16-inch monitor is going to make you that much more productive in your spreadsheet or word processing tasks—especially when

you consider that you'll pay \$600 to \$1000 more for the added screen space.

Besides, some 16-inch monitors require extra hardware to operate at their full 832 by 624 pixels on the LC III, Centris, and Performa. So that tacks an additional \$500 to \$1000 onto the price tag of a 16-inch display. The 14- and 15-inchers reviewed here don't need this. The factory-equipped video port of the Mac LC III, Centris, and Performa cranks out a 640-by-480-pixel display, perfect for 14- or 15-inch color monitors.

Most of the monitors reviewed here are the same multisync monitors sold in the DOS and Windows PC marketplace, but with the right cable adapter, they can also handle Mac video-display signals well. Although there are over 100 makes and models of 14- and 15-inch monitors sold for PCs, we chose the handful that sell as plug-and-play systems—VGA monitors with cable adapters bundled in or as an option.

Understanding Screen Size

This may seem like a silly question, but is a 15-inch display bigger than a 14-inch one? Both monitors run at the standard 640-by-480-pixel resolution, so any difference must be in the viewing area of the monitor. Unfortunately, vendors are wont to define this area differently. As a result, many users remain confused about what they're really getting when they buy a 14- or 15-inch monitor.

The difference between 14 and 15 inches

Although a 15-inch monitor has a larger viewing area, it still displays images at the same resolution as a 14-inch monitor; what you see are bigger pixels spread across a larger area and not more pixels. If viewers prefer the bigger viewing area, vendors may

try upping the resolution and pushing 15-inch monitors as smaller, cheaper versions of 16-inch displays. But 15-inch monitors really have too little room to adequately display the 832 by 624 pixels that 16- and 17-inch monitors do.

Active screen area There is no standard way to measure screen size. Although most vendors measure diagonally, between opposite corners of the picture tube, some vendors, like Apple, measure only the maximum viewing area of the tube (the portion that can display an image), excluding the outer portion of the tube, which doesn't display anything. Now, however, vendors feel compelled to base monitor "size" on the full size of the picture tube.

Rather than tangle with the meaning of vendors' screen-size ratings, pay attention to the active-screen area, the portion of the screen that actually displays an image. The diagonal measurement of the active screen for each monitor reviewed here falls between 11 and 13 inches. The active-screen diagonals of 15-inch displays average only 0.4 inches larger than their 14-inch counterparts. Since you can usually increase active-screen size above the factory setting, the differences are even less significant.

It's All in the Tube

The picture tube determines how rich the colors appear on screen as well as the level of glare (which you may or may not experience). Of the monitors tested here, Sony's CPD-1430 and Apple's Macintosh Color Display are good if you want the most vivid color for your multimedia displays, presentations, or scanned color images. Both of these monitors are built around Sony's trademark Trinitron CRT technology, which produces richer-looking



Measuring Midsize-Monitor Quality

OBSERVED QUALITY

Screen Focus

We examined text at several places on screen to detect how sharp a monitor's focus is. Sharper focus improves readability.

Color Saturation

We examined a scanned photograph at 16-bit color depth to gauge how well a monitor displays colors. More saturation ensures a truer display.

Color Balance

We examined the display for color shifts and color-display irregularities across the spectrum. Uniform color balance ensures a truer display.

Best result for each test.
Products are listed in alphabetical order.

	Screen Focus	Color Saturation	Color Balance
Apple AudioVision 14 (14-inch)	acceptable	acceptable	uniform
Apple Macintosh Color Display (14-inch)	acceptable	vivid	uniform
Mirror ProView MultiMedia (14-inch)	acceptable	acceptable	uniform
Mitsubishi Diamond Scan 15FS (15-inch)	fuzzy	acceptable	uniform
Nanao FlexScan F3401W (14-inch)	sharp	vivid	uniform
NEC MultiSync 3FGe (14-inch)	sharp	acceptable	slight red cast
NEC MultiSync 4FGe (15-inch)	sharp	vivid	uniform
Philips FastRefresh/15 (15-inch)	acceptable	acceptable	uniform
Philips Magnavox MagnaScan/14 CM9214 (14-inch)	acceptable	acceptable	uniform
Samsung SyncMaster 3N (14-inch)	acceptable	vivid	uniform
Samsung SyncMaster 15C (15-inch)	sharp	lackluster	strong greenish cast
Sigma ColorMax 15 (15-inch)	sharp	acceptable	greenish cast
Sony CPD-1430 (14-inch)	sharp	vivid	uniform

QUICK ROAD TESTS

You can't drag a test lab into a computer showroom or exhibition hall, but here are a few simple tests that will help you choose the monitor that is best for you.

Fill the screen with 10- or 12-point type and then check whether the type looks crisp in all areas of the display. Better monitors stay sharp, even in the corners.

Take a look at white text on a colored background to check color convergence. On a monitor with a color-convergence problem, the white text appears fringed with color.

Draw a circle or square on screen. Then increase the monitor's horizontal and vertical screen area to see how large an active screen area you can get without distorting the image and bending the edges of the square.

Glance at the screen out of the corner of your eye. This will usually alert you to any unnoticed flicker that may still cause eyestrain.

Look at the screen while chattering your teeth. Sounds strange, but that action interrupts any compensation your brain is making for a jittery display and helps you to determine which display is the steadiest.

If you can, get the dealer to help you simulate the lighting of your work environment. The lighting at the dealer's will show you the monitor at its best—your work environment may reveal some glaring issues.

color than does conventional tridot technology.

You should note that Trinitrons also use tridot technology—three phosphors (red, green, blue). However, where a conventional tridot arranges these phosphors in three-dot clusters, Trinitrons arrange the phosphors in three stripes. A slotted aperture grill focuses the electron beams instead of a conventional shadow mask composed of holes. This arrangement produces colors that are richer looking and more accurate.

Several other monitors we looked at offer *flat-square* picture tubes, a form of tridot technology that, though neither truly flat nor square, looks much flatter than the standard spherical-section tubes used in the Philips Magnavox MagnaScan/14 CM9214 or the Samsung SyncMaster 3N. These less-costly standard tubes definitely bulge out at the center, making them harder to look at, and they typically lack sharpness in the corners when you're looking at text. In addition, monitors with standard tubes are more prone to glare.

Generally, a flatter screen such as the Nanao FlexScan F340i•W is the best antiglare feature available, antiglare filters notwithstanding. With a flatter screen, slightly shifting the monitor's viewing angle usually redirects the source of glare out of your line of vision. A more spherical screen, such as that on the Samsung SyncMaster 15C, reflects light in all directions. No matter how you face a monitor with that type of screen, you still get hit with the glare.

Sound Off

Three of the monitors we tested have some bells and whistles you can really hear. The Apple AudioVision 14, Philips's Magnavox MagnaScan/14, and Mir-

MEASURED QUALITY

Convergence

Convergence denotes how closely a monitor's red, green, and blue electron beams hit the same pixel on screen. The better the convergence, the sharper the image and the truer the colors. A measurement of 0.45 or less is good.

Shorter bars are better.

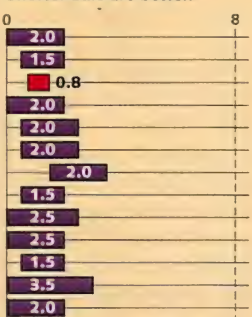


Millimeters

Distortion

Bars show the difference between a screen's minimum (left side) and maximum (right side) distortion. A maximum distortion of less than 8 is good. The longer the bar, the farther it is from 0, the more noticeable distortion is.

Shorter bars are better.



64ths of an inch

Gray Linearity

Gray linearity shows how accurately a monitor displays shades of hues across the spectrum from 100 percent to 0 percent. A perfect linearity measurement is 0. The worst possible linearity is 2700.

Shorter bars are better.

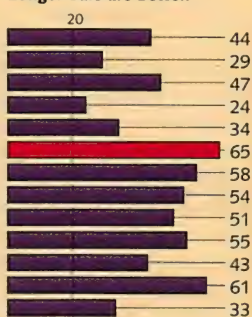


Total of variances from ideal in 12 tests

Brightness

Most people prefer a brighter monitor. We turned up the screen's brightness as high as it could go without showing scan lines. A monitor that puts out less than 20 footlamberts is considered dim.

Longer bars are better.

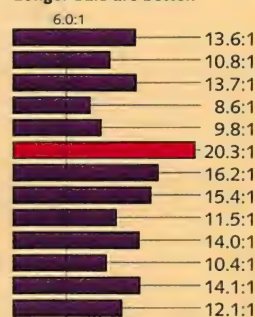


Footlamberts

Contrast

The greater the contrast ratio, the more details show up in both light and dark areas of an image. We calculated the ratio between the luminance of white and solid color squares throughout the screen. A ratio of 6.0:1 or more is good.

Longer bars are better.



Ratio of white luminance to solid color

Comparing 14-inch and 15-inch Monitor Features

Company	Product	List Price	Picture Tube Type ^A	Multisync	Weight (in pounds)	Active Screen Area (w × h, in inches) ^B	Active Screen Area (diagonal, in inches) ^B	Resolution (in dpi) ^C	Comments
14-inch									
Apple Computer	AudioVision 14	\$769	Trinitron	no	33.0	9.1 × 7.0	11.48	70 × 66	ADB support for video input. Display itself is dark, making it hard to see some colors on the blue end of the spectrum.
Apple Computer	Macintosh Color Display (14-inch)	\$539	Trinitron	no	25.0	9.1 × 7.0	11.48	70 × 66	No controls for image size—just the standard brightness and contrast.
Mirror Technologies	ProView MultiMedia	\$499 ^E	tridot	yes	26.4	10.3 × 7.3	12.57	63 × 63	Overly curved screen exacerbates glare.
Nanao USA	FlexScan F340i-W	\$899	FS tridot	yes	35.2	10.0 × 7.6	12.56	64 × 61	Has very convenient digital controls for fine-tuning colors. Stores three sets of RGB color adjustments.
NEC Technologies	MultiSync 3FGe	\$655 ^F	FS tridot	yes	38.1	10.0 × 7.4	12.44	64 × 62	Colors are somewhat flat. Control cover prone to breaking.
Philips Consumer Electronics	Magnavox Magna Scan/14 CM9214	\$499	tridot	yes	26.4	10.1 × 7.5	12.58	64 × 64	Fuzzy focus in the corners. Overly curved screen exacerbates glare.
Samsung Electronics America	SyncMaster 3N	\$599	tridot	yes	26.2	9.4 × 7.3	11.90	68 × 63	Doesn't display text as sharply as the 15C; colors are richer than the 15C's.
Sony Corporation of America	CPD-1430	\$779.95	Trinitron	yes	30.4	9.8 × 7.2	12.16	66 × 64	Has the most vivid display of colors of the monitors tested here.
15-inch									
Mitsubishi Electronics America	Diamond Scan 15FS	\$645	FS tridot	yes	28.9	10.6 × 7.8	13.16	63 × 60	Fuzzy focus in the center makes it hard to work with text.
NEC Technologies	MultiSync 4FGe	\$755 ^F	FS tridot	yes	39.2	10.1 × 7.5	12.58	63 × 61	Stores two sets of RGB adjustments and has an excellent manual. Control cover prone to breaking.
Philips Consumer Electronics	FastRefresh/15	\$699	tridot	yes	30.0	9.5 × 7.3	11.98	67 × 63	Fuzzy focus in the corners. Overly curved screen exacerbates glare.
Samsung Electronics America	SyncMaster 15C	\$849	FS tridot	yes	29.1	10.3 × 7.5	12.74	62 × 61	Has annoying flicker and slight moiré pattern.
Sigma Designs	ColorMax 15	\$599	FS tridot	yes	36.3	9.6 × 7.8	12.37	67 × 59	Dark gray cabinet matches PowerBooks.

Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests. ^A FS = flat-square. ^B Factory defaults (can be not offered at time of testing). ^C Sold directly only through Mirror; compare price to others' street prices. ^F Company's estimated street price (it has no list price).

ror's ProView MultiMedia come with a built-in stereo amplifier and speakers. All provide a simple way to boost your Mac's internal audio, sound card, or CD-ROM audio without cluttering your desk with stand-alone speakers and wires.

The AudioVision 14 is the best endowed in this area, with input jacks to support audio, video, and ADB devices, which are on either side of the monitor so you don't have to reach around the back to hook up a camcorder to the monitor. The AudioVision supports PlainTalk voice recognition as well as ApplePhone and other third-party telephony applications. And the monitor comes with controls for volume, brightness, and contrast mounted on the front of the monitor. But for all these nice devices, there's a price—\$769, which is at the high end of the monitors mentioned here that offer sound.

If your sound budget is a bit slimmer, the

Magnavox MagnaScan/14 comes with a 1-watt stereo amplifier and two 4-inch, round speakers hidden away at the base of the monitor. The amplifier wasn't functioning on the unit we received from Magnavox/Philips, but an identical model from Mirror sounded better than the inexpensive \$50 speakers you'd be tempted to buy.

You should note that low-priced Macs—the LC II and LC III, for example—offer only mono sound, as do PowerBooks and the Color Classic and Classic II. Likewise, the IIfx and IIfx sport only monophonic sound unless you add the optional CD-ROM stereo-audio upgrade. Centris, Quadra, IIfx, and IIsi models ship with built-in stereo audio, however.

Mac multimedia Though the Philips Magnavox MagnaScan/14 and identical Mirror ProView MultiMedia displayed merely acceptable sharpness and color richness, we think their audio capability

Phone	Toll-Free Phone	Technical-Support Rating
408/996-1010	800/776-2333	^b
408/996-1010	800/776-2333	^b
612/633-4450	800/654-5294	acceptable
310/325-5202	800/800-5202	poor
508/264-8000	800/632-4636	good
615/475-0317	800/835-3506	unacceptable
404/434-5400	800/726-7864	unacceptable
408/432-1600	800/352-7669	good
714/220-2500	800/733-8439	excellent
708/860-9500	800/632-4636	good
615/475-0317	800/835-3506	unacceptable
404/434-5400	800/726-7864	unacceptable
510/770-0100	800/845-8086	poor

technicians. Macworld uses a point system, including bonuses and demerits, adjusted via size controls). ^c At WYSIWYG 832 by 624 pixels. ^d Support

and relatively low price make them good home and educational purchases. Mirror sells the ProView MultiMedia directly for \$499, but we found we could order a MagnaScan/14 for as little as \$396 from a local dealer. Oddly, though the two are identical monitors, the one from Magnavox lacked some sharpness and the audio didn't work. Whether that's bad luck or poor quality control, we're not certain.

Touch That Dial

The controls on these monitors are a varied lot—some, like those for the Macintosh Color Display, are pretty vanilla, while others, like those for the Nanao FlexScan F340i•W and the NEC MultiSync 4FGe, have digital controls with more tools than you ever thought possible.

Nanao's FlexScan F340i•W, for example, offers RGB color-balance control along with an array of

screen-size, position, pincushion, and distortion controls. With the RGB color-balance control, you can adjust both base level and gain for the red, green, and blue video signals, and even set an overall contrast range with a separate subcontrast control.

NEC's MultiSync 4FGe also sports RGB color-balance control through its AccuColor color controls, letting you increase or decrease red, green, or blue video levels. You can store two sets of color adjustments in addition to the factory defaults.

The Sony CPD-1430 offers the most control over the size, position, and shape of your display. This is good if your work requires unusually precise screen geometry. Digital controls include keystone distortion, to prevent uneven image width between the top and bottom of the screen, and a keystone-balance control to correct any horizontal tilt. Side pin-

BEHIND OUR TESTS



Macworld Lab tested 14- and 15-inch monitors against two criteria: measured quality (objective) and observed quality (subjective). The tabulated results include quantitative measurements for the key aspects of monitor performance (see "Measuring Mid-size-Monitor Quality"). We measured brightness and contrast using a Minolta luminance meter on a standard black-and-white target screen. We determined gray linearity by measuring the separate levels of the red, green, and blue electron guns as we decreased the brightness of an all-white desktop in 10 percent increments. To measure geometric distortion, we displayed a black-and-white target of 1-inch squares in the center, the corners, and along the edges of the display. Then, using an antiparallax ruler, we measured the outer squares and compared them to the size of the center square. We used a Klein convergence meter to measure color convergence at each screen's center and in each corner.

To subjectively judge quality, we examined a scanned color photo and a page of text on each monitor under bright overhead fluorescent light and strong indirect sunlight (with the monitors facing the windows). The images were displayed at 640 by 480 pixels in 16-bit color depth using the Centris 650's built-in video (with 1MB of VRAM). Judges looked at the quality of each monitor's focus (assigning it a rating of sharp, acceptable, or fuzzy), color saturation (assigning it a rating of vivid, acceptable, or lackluster), and color balance (describing it either as uniform or by the perceived irregularity). Judges also kept an eye toward consumer-related concerns: the range and convenience of monitor controls, cabinet styling, antiglare qualities, and power supply.

—Macworld Lab testing supervised by Danny Lee

SMALL COLOR MONITORS


EDITORS' CHOICE

In addition to our quality evaluation, we considered price, technical support, and overall design (such as control types and placement) in determining our top monitor picks.

CPD-1430 This 14-inch monitor performed the best in all of our subjective tests, providing excellent saturation and color range. High-end graphics designers will like the richness of color for working with scanned images.

Company: Sony Corporation of America. **List price:** \$779.95.

MultiSync 4FGe Although color on this 15-inch display is not as vivid as that of the Sony CPD-1430, the 4FGe is still a great monitor for working with color images, and it has RGB-level adjustments. Also, it has a very crisp, sharp way of handling text. **Company:** NEC Technologies. **Estimated street price:** \$755.

Nanao FlexScan F340i•W This 14-inch display also ranks at the top with color handling and its level of controls—digital and analog for adjusting RGB cutoff and gain. **Company:** Nanao USA. **List price:** \$899.

cushion and pincushion-balance controls let you maintain straight vertical borders. In addition to nine default settings for different video signals (which you can modify), you can also store nine additional screen settings.

Missing the Cut

A few of the monitors we tested were disappointing in terms of the quality of display and the controls and ergonomics. Chief among these was Mitsubishi's Diamond Scan 15FS, which had low brightness and brightness uniformity, fuzzy-looking text, and merely acceptable color saturation. The rather plain-vanilla digital controls featured thin, bladelike push buttons that were uncomfortable to press. A further irritation: Switching to pincushion-adjustment mode requires that you switch off the monitor and perform an elaborate set of control-button sequences as you turn it back on. And at \$645 list, the Diamond Scan is not competitive with the better monitors.

The Samsung SyncMaster 15C is another monitor to avoid. Not as rich with colors as the NEC 4FGe, the SyncMaster 15C unit we tested showed a very noticeable greenish cast and was plagued by an irritating, headache-inducing flicker. Even the \$450 give-away mail-order pricing we uncovered wasn't enough to make this monitor tempting.

However, the \$340 mail-order price made the Samsung SyncMaster 3N slightly more enticing—as did its richer display and more uniform colors. But it didn't display text as sharply as the 15C.

Finally, the Philips FastRefresh/15 and the Sigma Designs ColorMax 15 just didn't have the features and color quality to compete. Besides, Philips has a few bugs to work out in its technical support. The company screens its calls, demanding full serial numbers for the monitors before transfer-

ring you to a technician. The support staff is quick to hang up on you and very rude—earning Philips an unacceptable in this area. Samsung also had unacceptable support.

The Best of the Lot

When all the tests were done and our subjective opinions had been duly registered, three monitors clearly stood out from the rest of the crowd: Sony's CPD-1430, NEC's MultiSync 4FGe, and Nanao's FlexScan F340i•W. Which one of these three you choose will probably depend on what you intend to do with the monitor.

Sony's CPD-1430 and Apple's 14-inch Macintosh Color Display, with their 14-inch Trinitron screens, produced the most vivid (saturated) colors of the bunch, and the most convincing displays of a scanned color image. The CPD-1430, however, has a bit more brightness, sharpness, and overall punch.

Surprisingly, the Apple AudioVision 14 monitor with the same Trinitron technology did not look as good as the CPD-1430 or the Macintosh Color Display. The colors are not as rich because the display is very dark. It's still a decent display, but the Sony CPD-1430 and the Macintosh Color Display are better.

Sony recently dropped the CPD-1430's list price to \$779.95, down from \$1029.95. Street prices were hitting \$599 at press time, compared with the \$480 rock-bottom street-pricing we found for the Macintosh 14-inch Color Display. Still, either of these are your best monitor choice for displaying scanned color images and other richly colored graphics.

In our subjective tests, NEC's 4FGe and 3FGe were the brightest and sharpest displays, with the brightness and uniformity exceeded only by the Sony CPD-1430. Judging from their high contrast scores, that perceived sharpness comes as no surprise, making these monitors tops for working with text. As for color, the 4FGe pulls ahead of its lower-priced companion, although its vivid colors were not quite as rich as those of the Sony and Apple Trinitrons. The 3FGe also had a slight reddish cast compared to the 4FGe's uniform balance.

NEC now quotes its official "estimated street price" instead of giving a list price—\$755 for the 4FGe compared with the \$599 street price of the CPD-1430. Though the 4FGe showed a higher distortion level than our other top picks, it wasn't critical.

If you want the most vivid color with a full range of digital controls, including color, then Nanao's FlexScan F340i•W is it. Scanned color images were second only to the Sony and Apple Trinitron displays in producing rich, vivid color. Color balance is a cinch, given this monitor's level of color adjustment. We particularly like the digital controls, which blend the best of digital push-button and analog control.

On the whole, we were happy with all of these top monitors and believe each of them would be a good choice for an entry-level or low-priced system. And since many of us never really need a larger display, our favorites among those tested have the kind of quality you can live with for years. ■

BOB WEIBEL is an Ashland, Oregon-based author specializing in consumer-oriented product evaluations and surveys.

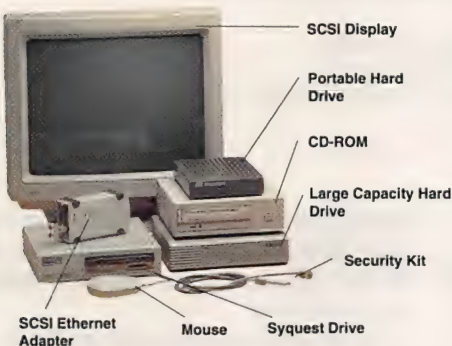
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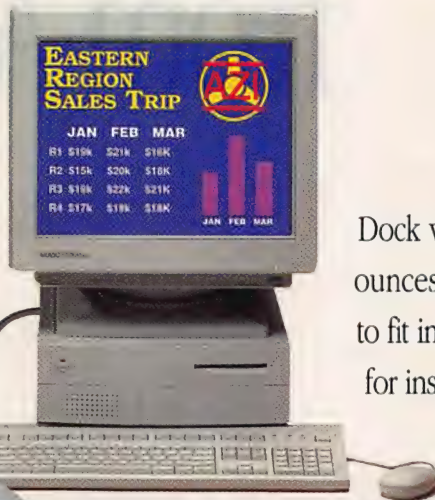


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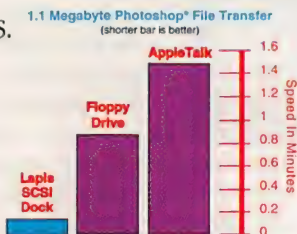
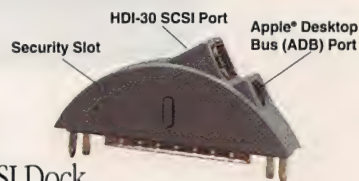
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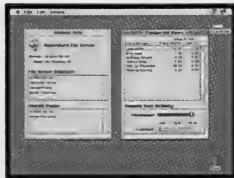
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*Prices based on Apple Computer, Inc. direct prices valid as of October 21, 1993. Prices for the Apple Workgroup Server 60 with 8MB of RAM and a 230MB hard drive and the Workgroup Server 80 with 8MB of RAM and a 500MB hard drive. AppleShare administration averages \$10,000 per year less than other systems, according to the Business Research Group (BRG) study "Lifecycle Costing for PC LAN Administration — A Comparative Analysis of 5 Leading NOS". ©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleShare, A/UX, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc. Apple Assurance is a service mark of Apple.

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hard drive start as low as \$2699 and \$4369, respectively. Both systems include System 7.1 and AppleShare 4.0 pre-installed and built-in Ethernet support. Keyboard, display and appropriate Ethernet transceiver sold separately. Environments: Environments compared were AppleShare, Banyan VINES, Novell NetWare, IBM LAN Manager and Microsoft LAN Server. Computer, Inc. UNIX is a registered trademark of UNIX System Laboratories, Inc. PowerPC is a trademark of International Business Machines Corporation.

THE 1993 MACINTOSH

GAME HALL OF FAME

The Macintosh Game Hall of Fame was thrown into a panic this spring when a squad of 14 men and women wearing yellow jumpsuits, surgical masks, and wrap-around sunglasses barged past our ticket taker and demanded to see the curator, yours truly.

"Are you sure you don't want the Devo Memorial?" I asked, assessing their garb. "It's down the street."

"No," boomed one of them. "We're in the right place. We are the Eco Police and we have determined you are a threat to the planet."

"How can that be?" I asked. "We deal in games for the Macintosh computer. Each year our crack team of nominators identifies contenders for the industry's most coveted honor, entry into the Game Hall of Fame. Then our final selection process occurs, consisting of a month-long binge by a single madman pushing 40 from the wrong end. Eventually, we have the best games from a number of categories, which are loosely defined so as to

allow entry to only the very best."

"One guy does this?" said the Eco cop. "Sounds pretty random."

"Believe me, he knows his games," I said, casting modesty to the winds. "Just take a look around here and try to find a classic Macintosh game that's not on our walls. You won't. Then try to find a sin-

gle turkey. You won't. We've been

doing this for years, buddy. The only complaints we get are from

losers who didn't cut it and from frustrated users who complain

that something they saw on Windows still isn't available on the Mac.

The former we tell to try harder; the latter we commiserate with."

"You're saying that even with all the LC III's and Color Classics out there, all the top games still aren't on the Mac?"

"Go figure. But believe me, there are plenty of great ones around. Just look at this year's selections . . ."

"Hold on!" said the Eco Policyperson. "I almost forgot what I came here



BY STEVEN LEVY



"I would like to thank all of the little people..."

for. Look at these game boxes!" He pointed to the day's stack of games, which reached to the ceiling. Then he grabbed one. It was the size of a textbook and 3 inches thick. He opened it up and pulled out three floppy disks and a 16-page manual. The rest was cardboard filler.

"Eco crime! Eco crime!" he shouted. The rest of his crew gathered around, joining in a ragged chorus. "Eco crime!" People were starting to circle.

The leader shook his head sadly. "I bet if you took that entire stack and removed the essential materials, it would take up a tenth of the space. Why do they do it, Game Hall of Fame Curator? Why?"

I had no answer. But after we cleared out all the cardboard and Styrofoam, I let the Eco Squad boot up selections from the Class of '93. When they finally left, many hours later, they were all smiling. And why not? This was a great year for Macintosh games.

BEST ARCADE GAME (TIE):

Lemmings for the Macintosh

Psygnosis Software; 617/497-5457; \$59.99.

Diamonds 2.0

Varcon Systems; 619/563-6700; \$49.95.

The term *lemmings* may remind old-time Mac owners of Apple's ill-fated 1985 commercial for the Macintosh Office, where IBM-sucking jerks in suits marched off a mountain. From now on, though, we'll always think of lemmings as little elfin dudes with green hair and unusual talents, like climbing, floating, digging, and—our favorite at the Hall—self-destructing. Oh yes, and they mindlessly march, to unspeakably catchy music, like lemmings.

In fact, if you don't stop them they hurl themselves off cliffs, into roiling seas, straight into fire-breathing machines, and suffer other Kevorkianesque fates. But you can stop them, by choosing certain elves to display those aforementioned talents. Doing this is at first simple, but as the screens get harder (and there are more screens here than in the multiplex at the Mall of America), the game becomes confoundingly challenging.

But never less than amusing. Those little lemming dudes are so cute, and so charmingly animated, that even as you



Lemmings The final stages of a Lemmings screen. The li'l dudes have built a bridge over bloody waters and are proceeding nicely into an oral escape. Those depressions on the left came from lemmings who self-combusted.

Get Stuck, you're endlessly amused. If you ever finish (we at the Hall haven't yet), you'll be wanting more. And sure enough, now there's Oh No! More Lemmings (\$49.99).

Diamonds 2.0

Just when you thought you'd seen every possible variation on Breakout—the post-Pong game where a bouncing ball erodes a brick wall by successive hits—along comes something else to make the concept fresh and challenging. In this case it's Diamonds 2.0, a simple little program that delivers many hours—too many hours—of distraction.

All you have to do is use the right- and left-cursor keys to steer the little blip on the screen, directing it to the bricks you want to knock off. Once you clear all the bricks, you rack up points by collecting the various diamond blocks on the screen. The catch is that the blip can only remove bricks that are the same color it is; to change the blip's color you have to direct it to different colored Paintbrush blocks.



Diamonds 2.0 Easy street? Anything but! On this level of Diamonds 2.0, you have to direct that blue blip on the right toward all the blue squares, change to the red color by hitting that key, and only then can you collect the diamond on the lower left.

Of course, you also have to avoid the Death blocks, marked by a skull and crossbones. Sometimes your pathway is blocked by Lock blocks, which require you to hit a certain block with a key. And every so often you encounter a Bouncer block that switches the direction of the cursor keys. To negotiate a level—there are 30 of them, each one causing more headaches than the preceding one—takes not only good timing and deft reflexes, but also a bit of cogitation.

As a bonus, you get to design your own new levels. Great—give them to your friends and watch their careers go down the drain as they spend their waking hours tapping on the cursor keys.

BEST ADVENTURE GAME:

King's Quest VI: Heir Today, Gone Tomorrow

Sierra On-Line; 209/683-4468; \$79.95.

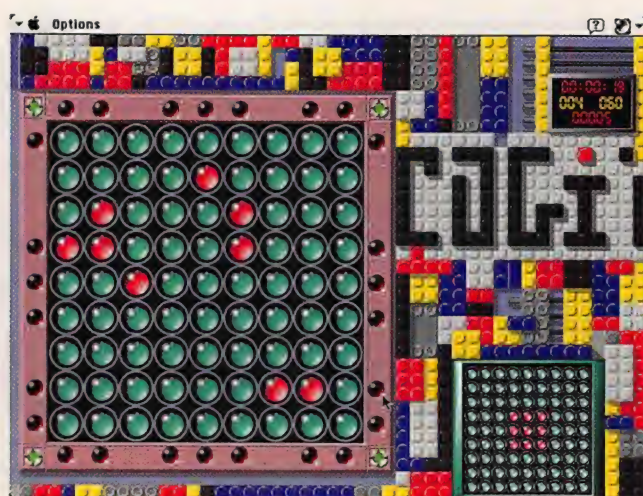
King's Quest VI, the latest in the series by Roberta Williams, is a worthy companion for Macintosh adventurers with a penchant for puzzle solving and a bent for the romantic—and 25MB of hard disk space. (That's not a misprint, this sucker comes on nine floppies.)

The plot, as framed by a stunning QuickTime animated minimovie (which you will watch once and delete, freeing up some of those megs), is timeless: Prince Alexander of Davenport is obsessed with Princess Cassima from the Land of the Green Isles, and when she calls him from a magic mirror (sort of a medieval paging device), he immediately sails to her homeland. But when he finally gets to her house, the Castle of Crown, a sinister vizier informs him that the princess is engaged to marry *him*, and the prince should take his act elsewhere. From then on the prince (you) must explore the four (or is it five?) Green Isles, interact with the inhabitants, and figure out the secrets of the lands in order to find out the real fate of the princess—and his (your) own. Good luck.

As you might expect with a game of this size, solving the quest is—well, a bitch. There are endless puzzles, spells, obstacles, and key inventory items that require persistent experimentation. There's also something called a Logic Cliffs (don't ask). But as Steve Jobs once said, the journey is the reward, and with King's Quest VI's simple interface, lush graphics, delightful orig-



King's Quest VI Prince Alexander of Daventry, in the grips of a potentially fatal attraction to Princess Cassima, attempts to prove his identity to gain access to her castle. His troubles are only beginning.



Cogito Those red marbles in the large grid to the left have to be rearranged in the square pattern shown in the small square to the right. Don't be fooled, it's a lot harder than it looks.

inal music, and wry humor, you'll find that the hours slip by, especially if your taste in adventures tends toward romance as opposed to body counts in dungeons.

BEST ROLE-PLAYING GAME:

Pathways Into Darkness

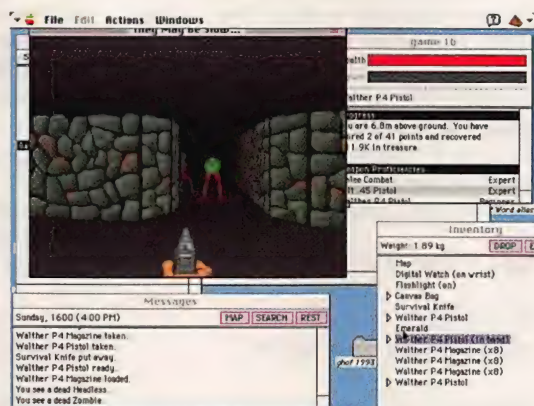
Bungie Software Products Corporation; 312/493-2849; \$69.99.

On the other hand, if you are an aficionado of body counts in dungeons, welcome to the state of the art. Although the plot line here isn't standard fantasy fare (something about saving the world from an alien invasion by searching an ancient Yucatán pyramid littered with the bodies of dead Nazis), people who have followed the genre from Wizardry onward will instantly experience a definite shock of recognition.

Shock is the operative word. You will also be dazzled by the best 3-D graphics that have yet appeared in such a game, and by the added scariness of blood-curdling, active stereo, panning sound. When these monsters come at you, they aren't simple line drawings, but something that might have come from a brain-merge of Tim Burton, Anne Rice, and Hieronymus Bosch. And when they throw fireballs or poison bones at you, you'd better duck. Yes, the key to getting through Pathways Into Darkness is ducking, and until you get the hang of it, you will die a thousand deaths.

That trick aside, the game play is as smooth as the graphics, adhering faith-

fully to the Mac point-and-click interface. But the nicest innovation is a wonderful map-as-you-go feature that keeps track of every move you make and every step you take. To get through this game you'll need all the help you can get.



Pathways Into Darkness On the third level of the Yucatán pyramid, you come across one of an endless procession of headless beasts, now hurling a green fireball your way. First duck, then blast him with the Walther you liberated from a dead Nazi.

BEST BRAIN GAME (TIE):

Cogito

Inline Software; 203/435-4995; \$59.95.

Oxyd

Dongleware Publishing; 617/497-1130; disk \$4 (also available from America Online, BMUG, CompuServe, and so on); book (necessary for higher levels) \$39 plus \$3 shipping.

Those who enjoy contorting their brains into pretzels will eat up Cogito, even as Cogito puts them through exquisite torture. Oh, the task seems so simple—to reconstruct the geometric figure on a

Chinese checkers-like grid scrambled by the computer. And indeed, the first puzzle will not tax anyone whose IQ tops his or her waistline. But each succeeding puzzle has a weirder way of controlling the movement of the squares. You wind up having to keep this new movement in mind as you plan ahead so that moving the tiles in one direction doesn't screw up the tiles you set up during the past six moves. You know, the old Rubik's Cube trick. While you figure things out, some sappy New Age music plays; fortunately you can turn it off.

Cogito has 120 of these puzzles, and to get through them you'll need the wisdom of Solomon, the patience of Job, and more spare time than anyone we know.

Oxyd

Though partially a skill game (you need a deft mouse hand) Oxyd is above all a mental challenge that forces you to discover ingenious solutions in order to unearth colored marbles and match them with their twins. All sorts of annoying, sometimes infuriating obstacles arise, but you are provided with some powerful remedies to dispel them. Our personal favorite involves setting off bombs with short fuses and getting out of the way pronto.

Almost as innovative as the game itself is the way Oxyd's publisher has distributed this bewitching game. The Oxyd software is widely available for the price of downloading, but you can play only the first ten landscapes before you must invoke the code words provided in the companion book—which will set you back 39 simoleons.

You get your money's worth. If somehow you manage to puzzle through all 100 landscapes, another 100 levels await you and a friend linked by network or



Oxyd Hell's a-poppin' on Oxyd's Landscape Six as fuses go off, bombs explode, and lasers blast away. Don't get distracted, your goal is to liberate the prizes in the corners.

modem. To solve these landscapes calls for more cooperation and patience than we at the Hall have managed to show thus far. Maybe by next year.

BEST STRATEGY GAME:

Pax Imperia

Changeling Software; 203/292-5087; \$69.95.

You think you're having a bad day? I've just been told by Petrov Menardovic, the prime minister of my personal intergalactic empire, that "We have just been reduced to a wandering, nomadic culture." Another tough round of Pax Imperia, a byzantine game-scenario of space conquest that combines elements of *Star Wars*, *SimCity*, and Adam Smith's *Wealth of Nations* in one absorbing package.

The goal is familiar if brash—to extend your empire throughout the universe. This involves everything from setting up an industrial infrastructure on planets to designing your own space-ships to tweaking the genetic makeup of your own species. It also involves choosing

whether to lead a regime based on economics, scientific advancement, or the dogs of war. The last is tough to resist, since infinite space really isn't big enough for you and your opponents (up to 16 players can participate). Besides, it's so much fun to invade planets.

Pax Imperia is lavishly presented—it's a superb exploitation of the Mac interface. The graphics are not merely flashy; they add to the depth of the game—from the *SimCity*-like surface view of individual planets to the striking portraits of the exobiological lineup from which you select your advisers. This is a space odyssey with truly operatic grandeur.

BEST SIMULATION:

SimLife

Maxis; 510/254-9700. \$49.95.

SimLife is not so much a game as an exercise in desktop biology, an opportunity to assume the role of a digital deity in a biosphere that plays by digital rules. The science behind this game (inspired by the field of artificial life, a subject much admired here at the Hall) is so rich that SimLife could actually be used as a tool to advance our understanding of biology. Students of genetics, evolution, and population ecology could use it as a standard text.

But don't tell people that. Even a casual gamer will find hours of diversion getting off on the goofy aspects of creating mutant forms of life, plunking them down on Earth, and letting nature take its course. Spicing matters up is author Ken Karakotsios's



SimLife In this little SimLife scenario, life on Earth is kind to the lobsters who are enjoying a swim away from pockets of radioactivity that contain mutagens. Potential deities can make use of the control panel on the left whenever they want to shake things up in the biosphere.

whimsical sense of humor, resulting in truly bizarre creatures. And when the animals make romance, you hear delighted squeals of oo-la-LA!

Start by trying out some of the enclosed scenarios, then take a dip in the gene pool and try some experiments. You can tinker with just about every environmental factor, from the mix of animals and plants in an area to the genetic make-up of your animals. You might stumble across some heretofore unrealized biological truths. And when your family members desperately call you to bed at five in the morning, just tell them you're too busy playing God.

BEST SIMULATION GAME, VEHICULAR DIVISION:

Falcon MC

Spectrum HoloByte; 510/522-3584; \$69.95.

Forget word processors and spreadsheets—what computers are really good for is flying F-16s. Strapping yourself into the cockpit, being surrounded by flight noise and the dispatcher's drone, readying a few GBU-15 Guided Bomb Units and maybe an AIM-9P Sidewinder or two, and kicking the afterburners straight into the wild blue yonder... that's productivity! Shoot down a few bandits, knock off a few missiles, drop a few smart bombs on unfriendly targets! Yes! Top Gun! Whoopee!

Sorry, we got carried away. The best jet simulator we've seen so far on the Macintosh is this baby, a rather supersonic improvement on the black-and-white iteration of a few years back. Although it doesn't have all the goodies from the IBM version (Falcon 3.0), Fal-



Pax Imperia The home base of this Pax Imperia empire is Sol B. Its surface view, with a city and three factories, is in the upper left. In the background is the Universe map showing the status of fleets. In space no one can hear you click.



Falcon MC The view from the ultra-high-tech cockpit of the F-16 fighter shows an enemy base ahead—those numbers and the crosshairs are part of the Heads Up display. An electronic map view appears in the lower center. And the circular radar screen to the left shows a bandit at seven o'clock. Time for an Immelmann!

con MC still has enough to keep even the most exacting fighter jockey busy, either flying the supplied missions or going head-to-head with enemy craft, whether computer-controlled or flown by your real-life nemesis over modem or network. The best part is the ultrarealistic gestalt, which gives you control over the most exotic electronic weaponry the Pentagon has ever come up with. (Just a few hours of playing Falcon MC provides invaluable insight into the mind-set of the military-industrial complex.) In addition, there's a lot of power in this plane—your Immelmann maneuvers will be smooth as silk, especially if you use a joystick like the Gravis MouseStick as your throttle.

Don't be intimidated if the manual occasionally departs from its normally clear instructions into something like, "When either the Maverick or GBU-15 is selected, the HUD goes into E-O mode and the REO goes into camera mode." Once you've logged some flight time, it all makes sense. Besides, what with Tom Clancy and the Gulf War, the jargon of high-tech warfare is no longer merely impenetrable—it's family fare!

BEST CD-ROM GAME:

Lunicus

Cyberflix; distributed by Educorp; 619/536-9999; \$79.95.

Lunicus is a mindblower. It begins with a role-playing exercise on a Moonbase inadvertently spared by invaders of Earth. The easy part is interacting with the space puppets on the base and getting your assignment to take a ship back home to save the planet. From that point, the game play explodes into an ultra-high-resolution

shoot-'em-up, with exciting pyrotechnics and a screaming rock 'n' roll sound track. It's sorta cyberpunk, a combo of electric guitars and laser guns. Unlike other CD-ROM games, which have an annoying lag between the time you pull the trigger and the time something happens, Lunicus moves with sufficient speed to keep you in the action. Your cyber alter ego has a great time blasting away killer robots and traveling through a war-torn Los Angeles.

There were other astonishing candidates for Hall enshrinement in the CD-ROM category (Time Warner Interactive Group's Hell Cab [see *Reviews*, in this issue] and The Journeyman Project from Presto Studios, to name two), but Lunicus, brainchild of Mac master Bill Appleton, gets the nod because it's the only one that doesn't let the speed limitations of the medium dampen the game-playing experience.

BEST NETWORK GAME:

Super Maze Wars

Callisto Corporation; 508/655-0707; \$64.95.

It isn't originality of concept that has gotten Super Maze Wars into the Hall. Face it, the idea of cruising around in a maze and shooting whatever hazards come into your line of fire is not exactly high concept. And like the cyberspace Spectre (from Velocity Development), last year's network winner, Maze Wars offers a selection of different styles of play, from Darwinian gun 'n' run to more cooperative efforts.



Lunicus Cowabunga! While you negotiate the corridors of a building on an Earth under siege, your weapon (in the foreground) gets a great workout blasting away evil robots. The sound of screaming guitars contributes to this CD-ROM game's frantic energy level.

So what did get Super Maze Wars on the list? Its terrific 3-D graphics, which provide an exciting verisimilitude as you and your opponents zoom through the various mazes. Its nicely laid-out control panel, which keeps track of the different players. Its special effects, especially the booming, zooming explosions that mark a



Super Maze Wars Uh-oh. While meandering through the Super Maze, our warrior has encountered Stepdaughter, a formidable foe. Once they get this close, you're a goner.

kill. And finally—the key criterion for any network game vying for Hall membership—it handles up to eight players without crashing. Super Maze Wars has the ability to engage several humans so deeply that the computer aspect becomes transparent, and people wind up playing against each other. That's what makes an otherwise ordinary arcade shoot-'em-up Hall of Fame material. **m**

STEVEN LEVY'S new book, *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything*, will be published by Viking in January.

by Charles Seiter

Brave New Documents

The Macintosh is an electronic Tower of Babel. The vast selection of text and graphics applications obviously benefits users, but this variety also hinders the ability to share electronic documents with other Macintosh or PC users. These numerous applications generate a myriad of file formats, and some Macs will be unable to decipher these files because they lack the creating application. Consider the following scenarios:

- You create a complex Microsoft Word 5.0 document with columns and tables and graphics that you will be sharing with others in your company. Unfortunately, some of your coworkers have Works—not Word—so they won't be able to read it. Even those who have Word 5.0 will usually need the same fonts you used in order to see the document in its original format.

- Perhaps you want to distribute a newsletter designed in Aldus PageMaker to a group of people who bought Performa 405s at Sears last week. You'll

have to face the fact that none of them are likely to have PageMaker for viewing your work.

- Suppose you set up your documents in a less ubiquitous application like DeltaPoint's Taste—the prospects are even slimmer that people will be able to read your document in its original format, since fewer programs can read this format.

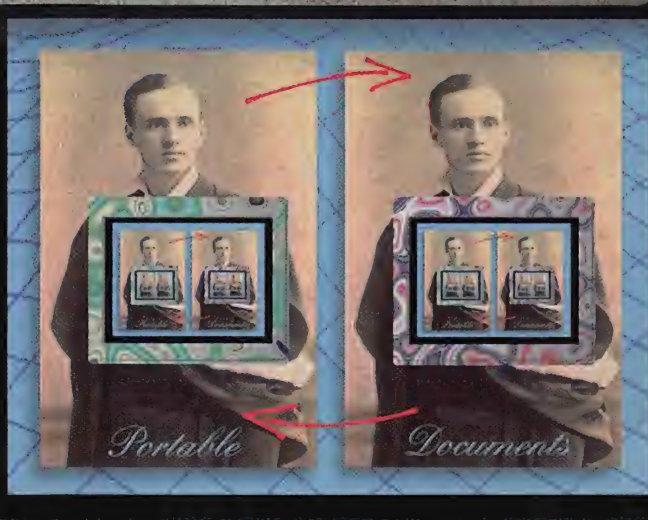
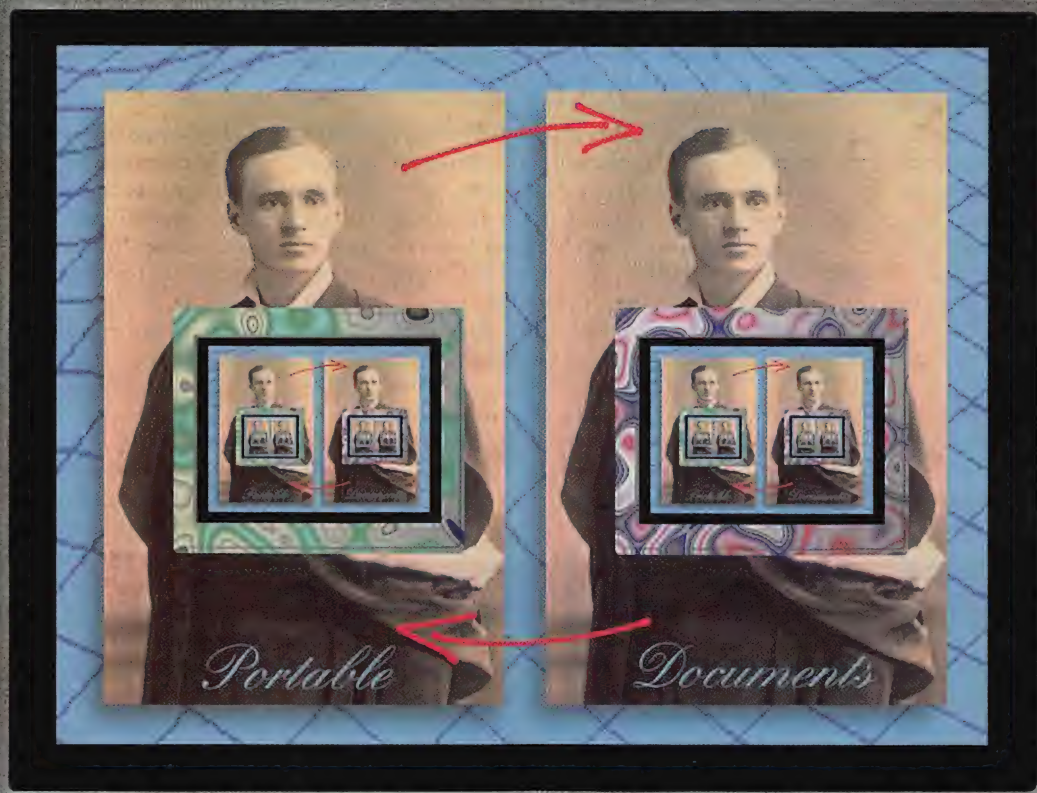
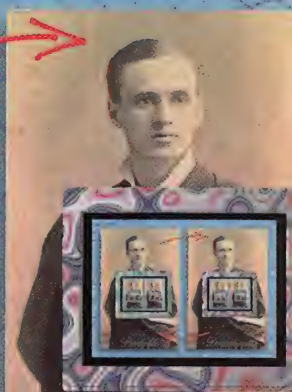
In all these cases, your last alternative for distributing a document in your own format is Old Reliable—hard-copy output from your laser printer delivered on foot.

This last year has brought about a potential solution in the form of document-interchange, also called portable-document, applications such as No Hands Software's Common Ground, Adobe Systems' Acrobat Exchange, Farallon Computing's Replica, Frame Technology's FrameReader, Interleaf's WorldView, and Electronic Book Technologies' DynaText. Generally, these programs take documents created in disparate applications and turn them into a common format that several users can then read electronically.

Additionally, all of these programs—except Common Ground—facilitate cross-platform viewing of documents. This is a more taxing issue to consider, since even applications like Word, whose Windows and Mac versions are nearly identical, can send cross-platform users into fits when they try to read files created on the other platform (see "Working in Two Worlds," *Macworld*, December 1993).

Several economic forces are also driving this move to sharing documents online. For large documents that change every few months, distribution and printing costs pose serious problems for companies. Beyond this, paper-based information has become inappropriate for the fast response cycle required of computerized businesses. As customers phone in product orders,

*Programs like Acrobat,
Common Ground, and Frame-
Reader break down
the file-format barrier*



order-takers need to provide current product, price, and availability information. Many catalog publishers accomplish this by keeping their work online. Likewise, satisfactory customer support these days requires that representatives find information within seconds by typing a few keywords instead of spending minutes leafing through piles of manuals at a desk.

Although some mainstream publishing tasks, such as electronic distribution of magazines on CD-ROM, have yet to be economically and technically debugged, portable-document programs are finding a home working with a number of other commercial documents.

Document-interchange programs vary in their ability to handle different types of documents. For instance, Common Ground is an excellent choice for documents of modest length, say, a 1- to 4-page memo. The more ambitious Adobe Acrobat Exchange and Distiller are better suited for documents ranging from 20 to 100 pages, such as a weekly or monthly department report. Electronic Book Technologies' DynaText is explicitly designed for viewing book-length documents, such as nuclear-submarine operations manuals.

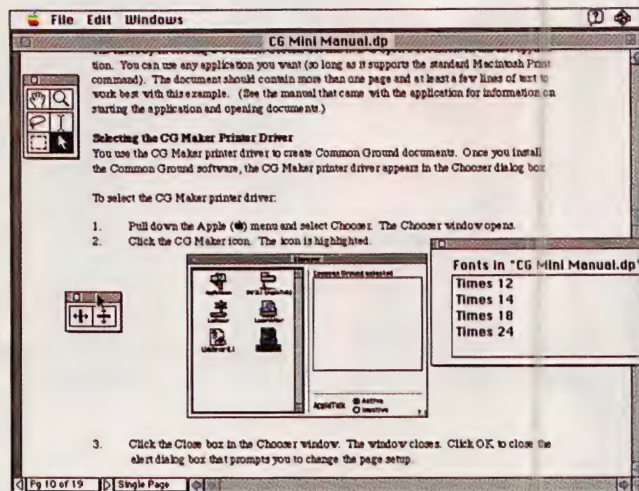
Text Tech

Document-interchange programs take two different approaches to electronic-document distribution—for simplicity we'll call one approach print capture and

the other approach mini app.

Print-capture applications—Common Ground, Acrobat Exchange and Distiller, and Replica—come with a driver that you select in the Chooser. This driver behaves like a printer driver, only it prepares your documents to be “printed”—for example, from your word processor or page-layout program into the portable-document application.

Once in this application, your document takes on the portable-document application's file format. Some print-capture products, such as Common Ground, let you attach a viewer to a document for distribution, while others, like Acrobat Exchange, require that users have their own copy of the document viewer (though Adobe was starting to sell a separate viewer for \$50 at press time). When the end user opens your document, the viewer plays back the document to the screen using the captured printing instructions.



Common Ground Common Ground, besides being exceptionally easy to use, offers mini palettes that list all document fonts (at right) and that allow simple selection of columns and blocks (at left).

In the mini-app approach, you use the portable-document program to create documents (or import them from a compatible application) and distribute them with a viewer. In mini apps, the viewer is essentially a read-only version of the program. Since the mini-app approach is used mainly for larger documents, mini-app programs need to be stronger at indexing, outlining, and hypertext linking than word processors or page-layout programs. The viewers for mini-app programs preserve these navigation capabilities while removing most editing features.

All of the programs reviewed here are designed to handle electronic documents on floppy disks, CD-ROMs, or networks. Most of the programs let you zoom in and out of selections to work around the problem of the Mac's standard 72-dpi screen resolution, which makes long-term screen reading tiresome compared with reading the crisp 300 dpi or better of printed text. Programs intended for use on longer documents support the compression of graphics—either by industry-standard JPEG or by proprietary algorithms—since even a small, 8-bit color illustration on a page is likely to increase the page's file size between 10K and 100K if no compression is used. Although the mini-app programs also support on-demand printing of documents, they're really intended for online documentation, with special features for easily updating frequently changing sections and for navigating huge documents (see “Portable Documents: Product Information”).

Low-Effort Document Viewing

Common Ground was released in early 1992 for the Macintosh (see *Reviews*, October 1993), with a Windows companion product promised for November

OTHER DOCUMENT-INTERCHANGE OPTIONS

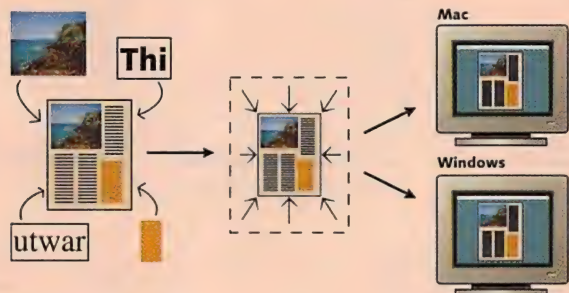
Although they are not strictly document-interchange products, the following two other products ought to be mentioned in a discussion of document interchange.

Adobe Systems' Super ATM solves one specific problem: font compatibility. Suppose you produce a document in ClarisWorks, using a large assortment of fonts. If you send it to another ClarisWorks user who doesn't have those fonts, the document will open using default fonts that are unlikely to preserve aspects of a document's formatting such as spacing. If the target system has Super ATM, however, the program will recognize the fonts in the original document and generate visual substitutes from fonts installed in the target system. The substitute fonts preserve the appearance of the original. Super ATM works with the 20 most-common document-creating Mac applications, so it's a plausible solution to many document-interchange problems, especially if you agree with the Adobe viewpoint that you should have to pay for document-viewing assistance. However, it won't work with most third-party Type 1 fonts, nor with most TrueType fonts. It's also very slow.

Ares Software has another technology for font portability. Font information is stored as a set of master outline files and small (2K to 3K) font descriptor files, with a rasterizer to produce output. The font family outlines are morphed from one font to another using information in the compact descriptor files—fonts are fattened or thinned or italicized according to mathematical rules. Ares's Font Chameleon for Mac or Windows (\$295.95) lets you build TrueType, PostScript Type 1, and your own custom fonts, but Ares is also licensing Font Chameleon to other vendors so that this compact style of font portability can be built directly into applications.

Two Types of Portable Documents

Print Capture Best for viewing compound documents. Converts many file formats, from multiple applications, into documents viewable on any Mac or Windows system. Programs in this category include Acrobat, Common Ground, and Replica.

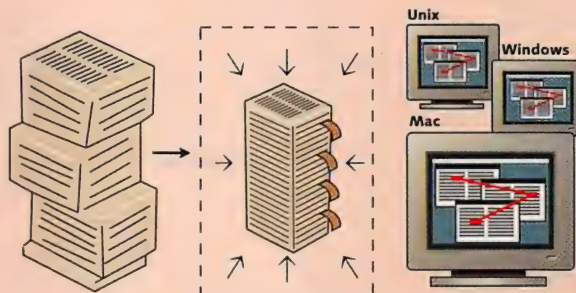


A designer in an advertising agency creates a graphics-intensive page-layout document—for example, a brochure in QuarkXPress with scanned images and multiple fonts.

Print-capture software then converts and compresses the document into a format that is viewable on systems that do not have QuarkXPress, access to the scanned images, or the necessary original fonts.

Using viewer software, the agency's clients can display the converted document on Mac or Windows systems. The brochure looks identical to the original, and clients can search, annotate, and print it.

Mini App Best for viewing and navigating large proprietary documents. Converts files only from compatible software. Programs in this category include FrameReader, WorldView, and DynaText.



A communications department in a large company creates a huge document for internal distribution—for example, a 700-page parts catalog or operations manual.

Mini-app software then converts and compresses the document into a format that offers extensive indexing and hypertext links.

Using a viewer (in this case, essentially a read-only version of the creating application), the company's employees can view, search, and retrieve information on Mac, Windows, and Unix systems.

1993. Of the products discussed here, Common Ground is by far the simplest to operate. You produce your document in any application, save it, and drag the document over the Common Ground AutoMaker icon. The program then automatically makes a PrintCapture Common Ground file that the Common Ground Viewer can read; this process leaves the original file intact. Using the full application instead of AutoMaker, you can attach MiniViewer (which is free and distributed on most online service bulletin boards) to the document to make it accessible to any Mac user, independent of the applications and fonts that user has. This technology, which debuted a few years back as Farallon's DiskPaper, is simply a page-by-page capture of QuickDraw printer instructions to a special file that the viewer can then print back to the screen or on paper.

You have a choice of 300-dpi printed output or, with some savings in file size, you can opt for lower resolution. If the document will be viewed only online—perhaps appropriate for documents with lots of color figures—72-dpi resolution is the appropriate choice.

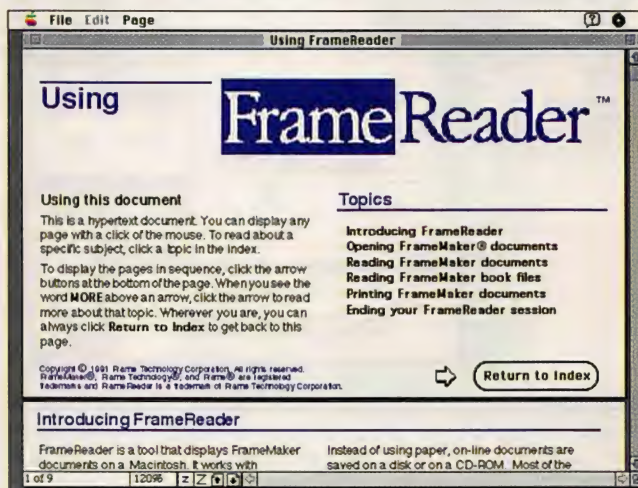
Common Ground is not the first choice for large documents. It does not support JPEG compression of graphics files, so the resulting files are close in size to files created in the original applications. This means that a 1.4MB floppy could hold perhaps 10 pages of catalog copy with accompanying color photos,

but more than 100 pages of text.

But Common Ground does have some nice features. For instance, it lets users of a document search, select, and copy text, and copy included graphics to PICT files. It runs on most Macs (it requires 2MB under System 6.0.5, 3MB under System 7), and at \$189.95 it is a bargain for less-than-industrial-strength document handling.

A Multitiered Approach

By itself, Adobe Acrobat comes in several shapes and sizes. The simplest product in the Acrobat system, Acrobat Exchange, works much like Common Ground. To make a readable newsletter file, for example, you pick Acrobat Exchange PDF-Writer in the Chooser and use this to print the newsletter as a .pdf (portable document format) file. Another Exchange user can then view the newsletter on a Macintosh or a Windows machine, making Acrobat Exchange a good choice for mixed-platform networks.



FrameReader FrameReader's simple interface uses in-document cues for hypertext links and clickable index subtitles to manage navigation.

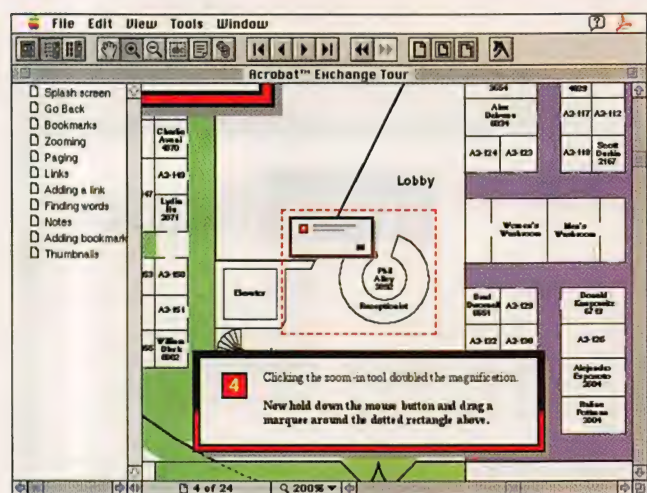
A major difference between Common Ground and Acrobat Exchange is that Common Ground's print-capture language is based on QuickDraw while Exchange's is based on Adobe's platform-independent PostScript, explaining Adobe's lead in cross-platform viewers.

Acrobat Exchange supports several features needed in big-document exchange. Users and senders can place bookmarks in a .pdf document, thumbnail pictures of pages make it easy to search for graphics, and a hypertext link facility lets senders create tutorial paths through documents.

Portable Documents: Product Information

	Adobe Systems	Adobe Systems	Electronic Book Technologies	Farallon Computing
Product	Acrobat Distiller 1.0	Acrobat Exchange 1.0	DynaText 2.0	Replica 1.0
Phone	415/961-4400	415/961-4400	401/421-9550	510/814-5100
Price	\$695 (network version \$2495)	\$195	\$150	\$99
Technology	print capture	print capture	mini app	print capture
Printed output resolution	to printer limit	to printer limit	to printer limit	to printer limit
Maximum enlargement	800%	800%	arbitrary	400%
Graphics	PICT, EPS	PICT, EPS	PICT, TIFF	PICT
Compression	JPEG	JPEG	●	○
Sound	○	○	○	○
Usage	good for newsletters and catalogs	works well for newsletters and can also be used to create catalogs	good for book-length documents as well as online documentation	good for newsletters and catalogs
Text search	word	word	string	string
Text copy	●	●	ASCII	●
Graphics copy	○	○	●	●
Hypertext links	●	●	●	○
Indexing	○	○	●	○
Notes	●	●	●	○
Thumbnails	●	●	○	○

● = yes; ○ = no * New version will be called FrameViewer and will add support for text searching by string, text and graphics copy, notes and annotations. ** Was called WorldReader in



Acrobat Adobe Acrobat Exchange's extensive feature set includes zooming on objects rather than whole pages. This allows convenient hiding and retrieval of information in complex graphics-rich documents.

Acrobat Distiller is a more expensive but subtly better program than Exchange—mostly because it has a set of JPEG compression options so it works well with color graphics. Additionally, its driver PSPrinter can generate high-resolution printed output because Distiller works with EPS (encapsulated PostScript) files. Distiller is currently used to publish catalogs on disk for mail-order companies and to publish company newsletters and annual reports for a long list of Fortune 500 companies.

Where Common Ground is best for smaller documents, Acrobat is currently a better fit for large jobs—at a large expense of disk space, however. Acrobat

requires 12MB of RAM for effective use but produces documents that are much smaller than those in the creating applications, a helpful feature for distribution across a network.

For Those on a Budget

Farallon Computing's Replica is a brand-new, low-cost (\$99, free viewer) system, designed with proprietary compression for convenient network distribu-

tion of documents. It consists of a Creator and Viewer in much the style of Common Ground, with a Creator driver that captures a document's QuickDraw printing instructions to a file.

Replica is easy and inexpensive, has built-in E-mail links, and supports high-resolution printed output beyond 300 dpi through embedded TrueType fonts. The main drawback to Replica is that we had only a beta version to test. Farallon chose to develop the Windows product first and has been experiencing delays in transferring its Windows graphical device interface to QuickDraw. Farallon has promised the Macintosh version for late 1993.

The Long Haul

Frame Technology is a leader in large-document management with its flagship product, FrameMaker. Frame's foray into document portability is FrameReader, available separately or as part of a FrameMaker bundle (a new version called FrameViewer is slated for early 1994).

As the name suggests, FrameReader lets users read FrameMaker files without the application. FrameMaker generates files that are typically very large and loaded with hypertext links. FrameReader can follow these hypertext links within and among documents, and it supports document printing (along with sound and video annotation). FrameReader also supports FrameMaker's graphics-import-by-reference feature, in which graphics are stored in a separate file and printed, or displayed on screen, on demand. This means users can update graphics files independently without changing the entire FrameMaker document.

Because FrameReader deals with such large documents, it has some text-retrieval capabilities such as Boolean searches (find a file that contains the words *back* AND *front*), proximity searches (find two keywords in the same paragraph, for example), and thesaurus searches (pick a word and search for words with a similar meaning). Unfortunately, you will only find out about these features when someone in your company decides to make FrameMaker the documentation standard, because FrameReader reads only documents processed by FrameMaker.

Frame Technology	Interleaf	No Hands Software
FrameReader *	WorldView 1.1 **	Common Ground 1.0
408/433-3311	617/290-4985	415/802-5800
\$84.95	\$195	\$189.95
mini app	mini app	print capture
to printer limit	to printer limit	to 300 dpi
400%	200%	400%
PICT, TIFF, EPS	PICT, TIFF	PICT
●	●	○
●	○	●
best for manuals and other online documentation, but works only with documents generated by FrameMaker	good for manuals and other online documentation, but designed primarily for use with documents processed by Interleaf	best for small documents such as newsletters
word	string	string
○	●	●
○	●	●
●	●	○
○	●	○
●	●	○
●	○	●

earlier version.

Taking a World View

Interleaf, like Frame, is a vendor with a large-document bias—Interleaf software has long been a standard for preparing complex documents on Unix systems. WorldView 1.1, the viewer for Interleaf documents, has been shipping since early 1992. WorldView 2, promised for late 1993, will include the International Standards Organization-defined Standard Generalized Mark-up Language (SGML) for input, output, and greatly expanded searching capabilities. WorldView 2 will offer an advantage to documentation managers in the minicomputer world, who usually have SGML experience; but others will benefit too, since various print-capture products have brought many of SGML's basic editing and searching capabilities onto desktop systems.

The cross-platform WorldView 1.1 consists of two parts. WorldView Press imports documents from word processors (such as Interleaf's own product), page-layout programs, and drafting software, and allows an editor to add hypertext links and an index, and then compress the resulting file for distribution. WorldViewer (called WorldReader in earlier versions) can view, search, and print pages or longer sections of documents made in WorldView Press. The authoring tools in WorldView Press—although they preserve fonts, graphics, and other formatting niceties—are intended for structuring information retrieval, not laying out pages. The Interleaf emphasis on information navigation rather than pretty documents shows in WorldView's features

evolution: WorldView 2 will be the first version to support color, while the first version of WorldView already featured search capabilities beyond those of Acrobat or Common Ground.

Going by the Book

Like Frame and Interleaf, Electronic Book Technologies (EBT) aims at the market for book-length electronic documents. Depending on the type of project you're undertaking, EBT's pricing strategy varies. EBT charges \$1000 per title for software (called the PubPac) for producing an online book or CD-ROM, including unlimited rights to distribute a read-only browser (which works like a viewer) with the books.

The typical EBT customer uses DynaText (the first Mac product based on SGML) to create in-house electronic documentation for giant projects. The pricing for these projects can range from about \$12,000 to tens of thousands of dollars. A separate browser is also required.

The DynaText Browser supports full-text search, proximity searching, searching for patterns with multiple wildcards, on-demand printing, hypertext links, bookmarks, and multiple paths through documents. Document information is called up and formatted dynamically, allowing users to browse multiple sections of the same document on-screen at the same time, a point that distinguishes DynaText from products like Acrobat.

The use of extensive SGML makes DynaText a rather alien system by traditional Mac standards, in which Quick-

Draw and PostScript define the basis of text formatting, but it provides advantages in indexing. It also improves communication with the minicomputer world and professional publishing systems. EBT maintains that its product is weaker than its competitors at distributing small, highly formatted documents, but that 500-page online manuals usually call for less fancy font work and better search facilities, DynaText's strong point.

Many Ways to View a Document

Although the products discussed here all support application-independent document viewing, there are great differences between them in scope. Common Ground has an edge in distributing smaller documents, such as simple newsletters; Acrobat is the best choice for larger documents with strict formatting requirements; and the SGML-based products have advantages for online retrieval of data from very large documents.

With the recent explosion of portable-document software, you may find that within a year or so you're using your Mac simply as a document reader at least half the time. You may also find that you're quite happy using it that way. **m**

Contributing editor CHARLES SEITER has reviewed most of the products in this article. His particular interest is cross-platform application-independent distribution of complex scientific documents.

PORTABLE-DOCUMENT PROGRAMS



Since portable-document applications fall into two categories (mini app and print capture), our selections reflect our favorites in each category.

Common Ground If you're interested in experimenting with application-independent document distribution, start with Common Ground. It's easy to use, and its viewers are free. Besides, cross-platform use is on the way as a Windows viewer is promised for November 1993. **Company:** No Hands Software. **List price:** \$189.95.

FrameReader For book-length documents, FrameReader is currently the pick for use on the Mac. It includes many text-search and -retrieval features, and it follows FrameMaker's hypertext links. Its competitors have some desirable SGML features, but these haven't been as thoroughly adapted to Mac use. **Company:** Frame Technology. **List price:** \$84.95.

Scanning on the run

Macworld Lab tests five hand scanners for OCR and image quality

Do you often need to grab a snippet of text for future reference, or a small graphic, such as your company's logo, to complement a presentation? Is that text or graphic in a book or on an oversize page, such as a newspaper? Is your desk already hopelessly crowded with too much equipment? A simple hand scanner may be your solution.

Macworld Lab tested five hand scanners for their accuracy and speed in capturing graphics and performing optical character recognition (OCR) on a range of text samples. (OCR software creates text files that you can edit, index, and manipulate as if you had typed the text at the keyboard.) To understand our results, first consider hand scanners in comparison with flatbed scanners.

A hand scanner fits in the palm of your hand; you roll the device slowly across a piece of paper, and an array of photosensors in the scanner records the image. A flatbed scanner works in the manner of a photocopying machine; you lay down a sheet of paper on a platen, then the scanner moves the photosensor array past the page. Either type of

scanner can capture graphics and create readable text files with OCR software.

Hand scanners work well for draft-quality halftones or line drawings, but only one model we tested, the Caere OmniScan, offered reasonable accuracy results for a range of OCR jobs. And even the OmniScan couldn't compete with the best results from flatbed scanners. If you are serious about graphics or must have top-quality OCR on a variety of documents, forget hand scanners.

Flatbeds more consistently produce high-quality results, but at a price. Although flatbed scanner prices have dropped to under \$800—with some under \$500—OCR and image software may add another \$1000. This is substantially higher than the prices of the hand scanners we tested, which range from \$399 to \$599, including OCR software.

Getting the Knack

Hand scanners require some practice to master. As you scan, you must hold down the scan button, move the scanner at a suitably slow pace, and keep the scanner rolling in a straight line.

Holding down the scan button is easy enough, except on the Thunderware models, whose curved contours make them a little hard to grab. The straight sides of the Logitech ScanMan 32 and the Mustek Langelo Gray are easier to hold. Caere's large OmniScan doesn't fit well in small hands, but it and the Mustek Langelo Color put the scan button on top, giving left-handers equal access; the other scanners' button placements favor right-handers.

Moving the scanner at a smooth, even rate presents the greatest physical challenge. The maximum scanning speed depends on how much detail you need. Scanning with a higher resolution using grayscale requires more time to capture the image, so you must move the scanner less than 1 inch per second, in one smooth motion—not an easy task for beginners. Scanning a 5-by-7-inch photograph vertically, for example, took about 10 seconds with all the scanners except the Langelo Color, which took 16 seconds, a very difficult half-inch-per-second pace.

All hand scanners have an LED on top that paces the

PHOTOGRAPHS BY LUIS DELGADO

inlog



scanning speed. A steady LED means that all's well; a flashing one, that you are pushing the speed limit; when the light goes out, you've gone past the limit and will have to restart the scan.

Keeping It Straight

Scanning in a straight line poses another challenge. All the scanners have three rollers—one wide main roller just below the sensor array and two stabilizing rollers about 4 inches below the sensors. The rollers help keep the scan on a straight course for only a few inches; on longer scans, the natural arc of your moving arm tends to pull the scanner off course. Only the Thunderware scanners come with a snap-on plastic guide for use

with straight edges. The side of the scanner head by itself is too short to guide the scanner along a straight edge, regardless of what a vendor may claim (see "Straight Edges and Narrow Borders Allow the Best Scan").

Two companies sell plastic contraptions that help any hand scanner achieve straight lines. Scan:Align (214/380-8724) sells a \$39.95 product of the same name that rests the scanner between parallel plastic guides. The Lyra Group (908/920-9667) produces The Tray for \$49.95; it allows scanners to ride on raised rails. These rather bulky devices help for scanning loose sheets of paper. If you regularly need the assistance of a large plastic guide, however, you're better

off skipping all the fuss and investing in a flatbed scanner.

For some scans, no straight edge will help. If you scan a book, you have to wrestle with the book and the scanner. Unless the book has unusually wide margins, you have to turn the scanner sideways to capture the image in landscape orientation, then reorient using the scanning software. Whichever way you scan, the two small guide rollers fall off the page's edge before the sensors reach the edge of the image; you can keep on going, but maintaining a uniform scan is pretty hard. (To be fair, flatbed scanners have difficulty with bound volumes also.)

For maximum flexibility when scanning in tight spaces,

by Cary Lu



such as with a book, a hand scanner should have the smallest possible borders of its own—that is, it should scan right up to the physical edges of its sensor array. But no company seems to understand this; all the scanner heads take up

The scanner samples the image as you roll it down the page; a movement detector geared to a roller in the base of the scanner sets the sampling rate.

Besides the scanner button, most units have a rotary brightness control (the

tively, out of a possible 37 (see "Graphics Recognition Skills"). The LightningScan Pro can be switched to black-and-white for capturing line drawings quickly; the OmniScan only goes after 256 grays, so you have to spend a few extra seconds

For basic graphics, ThunderWorks offers clarity and simplicity

unnecessary space around the sensor array. By far the worst offender is the OmniScan, whose case wastes .5 inch on the left and right margins and .25 inch along the top. This is merely a poor design; the large margins serve no purpose whatsoever.

Grabbing the Image

All the monochrome and gray-scale scanners operate at up to 400 dpi with a horizontal linear array of 1680 charge-coupled-device (CCD) photosensors for a maximum scan width of 4.13 inches. The Mustek Langelo Color, which operates at 200 dpi in color and 400 dpi in gray scale, has 840 color sensors; each color sensor has a red, green, and blue component for a total 2520 sensors (only the red and green sensors operate for gray scale).

exception, OmniScan, does this in software). All have a resolution switch, and most have a gray-scale and a halftone-spot-size switch. The less expensive models are black-and-white scanners, but even these can produce some gray-scale information through software, by comparing adjacent pixels and synthesizing grays. Properly adjusted, these scanners produce 32 to 64 grays, enough for recognizable images on standard ink-jet or laser printers.

Under the best conditions, the LightningScan Pro and OmniScan can detect 256 shades of gray—as many as any common graphics-reproduction device, such as a video display or halftone printer, needs for a high-quality image. But in our tests run at the highest dpi settings, these units captured 32 and 27 grays, respec-

scanning, then converting to a black-and-white image with the software.

The halftone-spot-size switch on all the scanners sets the printer-screen size of a halftone image; a finer screen size reproduces fewer grays with greater sharpness; a coarser screen produces more grays but lower sharpness.

Scan quality All of these hand scanners can capture simple graphics at a quality level suitable for most business documents. The ScanMan 32 and LightningScan 400 captured fine lines and detail best, with the LightningScan Pro 256 a close second. At its highest settings, the OmniScan did not capture fine lines well; small objects tended to fill in, which hurts more often than it helps.

For photographic images, however, the OmniScan did best, followed by the



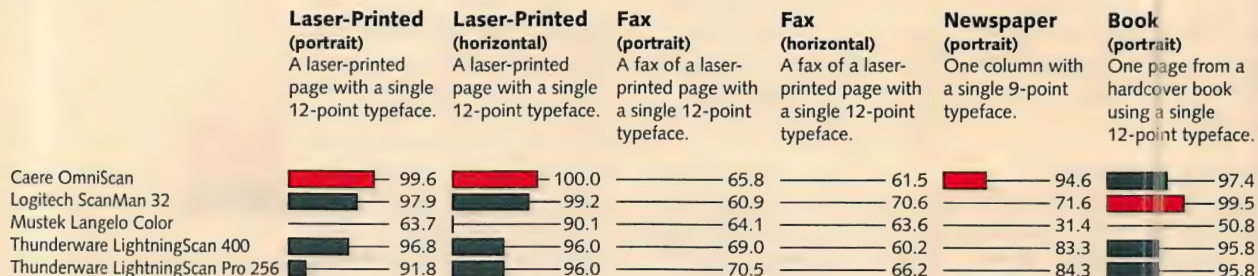
Hand Scanner OCR Skills

Best result for each test. Products are listed in alphabetical order.

HOW ACCURATE ARE THEY?

Accuracy results show percentage of correct words in document. Longer bars are better.

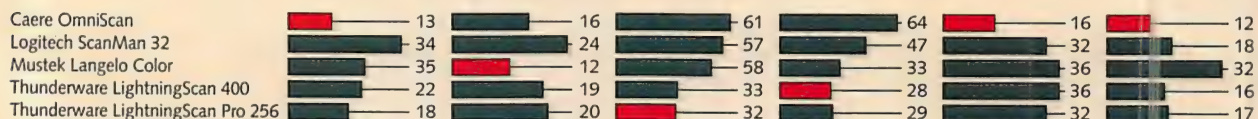
Accuracy of less than 90 percent almost always results in unusable documents. The difference between, say, 92 and 96 percent accuracy is significant. Bars representing accuracy start at 90 percent, and there are no bars for less-accurate programs. Some documents—faxes in particular—are so difficult for OCR programs to handle that the results are often unacceptable. Documents were scanned in either portrait or horizontal orientation, as noted.



HOW FAST ARE THEY?

Times are in seconds. Shorter bars are better.

Given an acceptable level of accuracy, the next most critical factor in choosing an OCR program is the recognition speed. Here, the speeds reflect the time to recognize one page or column, as described above.



LightningScan Pro 256 and the Mustek Langelo Color. The black-and-white scanners trailed far behind. Only the Mustek Langelo Color could capture color, but its images were faded and washed out.

Scanning software All the hand scanners reviewed here come with scanning software that can handle all typical tasks and the most common file formats—PICT, TIFF, and MacPaint. All can rotate an image so you can scan sideways if necessary.

For basic graphics scanning, I liked ThunderWorks (bundled with the LightningScan series) the best for its clarity and simplicity. ThunderWorks doesn't try to do sophisticated retouching; in contrast, the programs bundled with the other scanners offer heavy-duty image-creation and -manipulation tools. Logitech includes Aldus Digital Darkroom in one of its bundles, Caere puts in its own Image Assistant, and Mustek offers Color It (with the Langelo Color) and Enhance (with the Langelo Gray) from Micro-Frontier. For the kinds of graphics and tasks that hand-scanner users typically deal with, these programs are overkill; but they do provide an elaborate set of tools if you have the skills to use them.

For actually scanning an image, the OmniScan forces a spurious step; when selecting a new scan, you first have to click on a scan button on the Mac's screen, and then press the scan button on the scanner to capture an image. With the Thunderware and Logitech scanners, you merely select a new scan on the Mac screen and start right in.

The OmniScan features automatic stitching—if an image is too wide to cap-

BEHIND OUR TESTS



Macworld Lab split the scanner testing into two sections, graphics and OCR, to show the strengths and weaknesses of each unit.

Graphics To test resolution, we used an alphanumeric test pattern from Rochester Institute of Technology: a grid of numbers and letters in gradually descending sizes. To determine how many shades of gray each scanner could see, we scanned a 37-step gray-scale strip produced by Stouffer Graphic Arts and counted the number of gray bars each machine could discern. In each case, we used the scanner's highest dpi setting. We also scanned a 5-by-7-inch gray-scale photo at 300 dpi and then printed and evaluated the clarity of the image subjectively. For scanning speed, we measured the time it took for the fastest possible pass across the image that resulted in a usable scan.

OCR For OCR testing, we scanned a laser-printed letter with a single 12-point typeface; we also scanned a fax of the same document. The faxing process both reduces clarity and slightly compresses the image. We also scanned one column of a *New York Times* article, which uses 9-point text, and one page from a hardbound book with 12-point type. We graded accuracy by counting as one error any word or stray character that required a mouse click and typing to correct. If several words in a row were garbled or skipped, we counted each word that required retyping as a single error. We noted the speed for recognizing the text, not including the time needed to scan the document. Overall efficiency—a combination of speed and accuracy—varied widely. It's best to determine what kinds of documents you would routinely scan, then look for the best scanners in those categories. We found that faxes were, in all cases, too difficult for these devices to process effectively.

We tested on a Centris 650 with 8MB of RAM, a 230MB hard drive, and the 14-inch Macintosh Color Display. To keep our scan lines straight, we used ScanAlign, a \$39.95 hand-scanner guide from the company of the same name (214/380-8724).

—Macworld Lab testing supervised by Danny Lee and Tim Warner

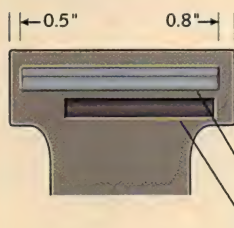
ture in a single pass, you take another pass to get the rest, and the software tries to match up the two swatches automatically. Unfortunately, the process often fails. On a simple graph with a clear rectangular border, autostitching always cut off enough image at the join to render the

results useless. Doing separate scans and joining them manually proved more reliable. Thunderware helps with manual stitching; you match the images by hand, selecting corresponding points in swatches and anchoring them with "pushpins." The method is tedious, but it works, and

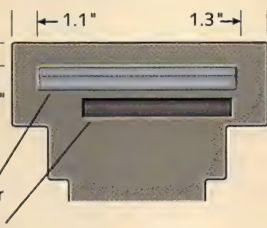
Straight Edges and Narrow Borders Allow the Best Scan

Two critical challenges in hand scanning involve moving the scanner in straight lines to capture images accurately and fully, and capturing images in restricted spaces, such as the inside margins of a book.

Narrow borders

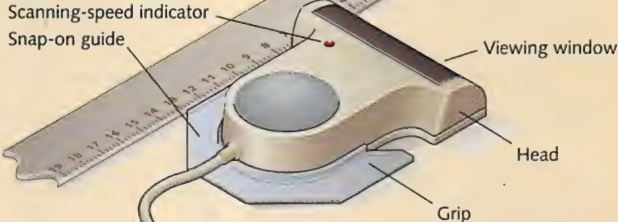


Wide borders



Every hand scanner uses a plastic border to hold the light sensor in place. The wider the border, the more difficult it becomes to scan in tight spaces. Most hand scanners (such as the Logitech ScanMan 32, above at left) use relatively efficient borders. In contrast, Caere's OmniScan (above right) suffers from much wider borders—more than 1/2 inch wider in some cases—than its competitors.

Straight-line aid



Hand scanners—with a wide head to accommodate the light sensor, but with a narrow grip—make scanning in a straight line difficult. Only the Thunderware scanner series easily solves the problem. Thunderware supplies a snap-on guide (shown above) that lets the scanner follow a straight edge smoothly, maintaining a uniform 90-degree angle between the light sensor and the edge.

multiple pushpins can even adjust for modest distortion. Logitech provides less help with its manual stitching; you simply can overlap portions of the image (the manual calls this "automatic"); the overlaps are then corrected in software.

mum acceptable. However, CatchWord Pro did better than OmniPage Direct on a book scanned in portrait orientation. (The OmniScan also includes Caere's FaxMaster send-and-receive software. It's amazingly good at OCR on received

Compatibility Concerns

Before you buy, you should verify that the scanner will work with your Mac, because compatibility varies widely. The OmniScan works only on Macs with a 68020 or better CPU and at least 8MB of RAM.

The OmniScan from Caere stands out as the OCR leader

Only One OCR Choice

Most of the scanners bundle an OCR package; the exception is the low-end LightningScan Compact.

The OmniScan stands out as the OCR leader. Macworld Lab got good results on cleanly printed text (see "Hand Scanner OCR Skills"). Only the OmniScan, with its OmniPage Direct software, can compare to a flatbed scanner for OCR, but in informal tests on many different pages, its big-brother OCR program, OmniPage Professional, running with a flatbed scanner always did better.

Logitech's CatchWord Pro came in a distant second in OCR performance. Although its measured error rate on clean text may seem close to the OmniScan's OmniPage Direct, the additional 1.7 and 0.8 percent correspond to 10 to 35 more erroneous characters per page, a big difference when you do OCR regularly. I consider a 1 percent error rate the maxi-

faxes, but its send features alternate between puzzling and appalling. To find a fax number in the FaxMaster database, for example, you must type the entire name field exactly—not just "Apple" but "Apple Computer, Inc.")

Olduvai Read-It (bundled with the LightningScan series) and CTA's ScanReader (bundled with the Langelo units) were so unreliable that you shouldn't bother trying them. Read-It did a credible job on one single scan out of two dozen laser-printed tries. It was apparently a fluke; when I scanned the same page again, the results were poor.

For reasonable OCR quality without an OmniScan, you could take a TIFF image captured by another hand scanner, and feed it into a heavy-duty OCR package. But it's hardly a cost-effective solution. Aside from the cost of the OCR package (over \$500), you will also need at least 8MB of RAM.

The other SCSI-interface scanners work on most Macs with as little as 2MB, although all prefer 4MB. The Mustek scanners are a puzzle; the company says that its scanners require a 68020- or 68030-equipped Mac; the scanners don't work with Quadras, and the company doesn't know about compatibility with the Centris line. *Macworld* was unable to get the Mustek Langelo Color to work with its bundled Color It software on any Mac, but we did get the scanner to work on a Centris 650 with Adobe Photoshop, using plug-in software supplied with the scanner.

Two of the reviewed scanners don't use the SCSI port. The LightningScan Compact uses the SuperDrive floppy disk port in several Macintoshes (IICI, Classic, Classic II, SE/30, and later SEs).

The LightningScan Portable is specifically designed for PowerBooks, connecting through a serial port. It works

Focus on Hand Scanners

	Caere	Logitech	Mustek	Mustek	Thunderware	Thunderware
Product name	OmniScan	ScanMan 32	Langelo Color	Langelo Gray	LightningScan 400	LightningScan Compact
Phone	408/395-7000	510/795-8500	714/833-7740	714/833-7740	510/254-6581	510/254-6581
Toll-free phone	800/535-7226	800/231-7717	800/468-7835	800/468-7835	800/628-0693	800/628-0693
List price	\$595	\$399 (with Digital Darkroom), \$499 (with CatchWord Pro)	\$599	\$359	\$399	\$259
Connection	SCSI	SCSI	SCSI	SCSI	SCSI	SuperDrive floppy port
RAM (required/recommended)	8MB/8MB	2MB/4MB	4MB/4MB	4MB/4MB	2MB/4MB	2MB/4MB
Scanner margins, in inches (left/top/right)	1.1/0.9/1.3	0.5/0.6/0.8	0.5/1.0/0.5	0.4/0.6/0.4	0.6/0.7/0.75	0.6/0.7/0.75
Stitching for graphics	automatic	manual	○	○	manual	manual
Stitching for text	●	●	●	●	●	NA
Includes snap-on guide for working with straight edge	○	○	○	○	●	○
Resolutions supported (in dpi)	400, 300, 200, 100	400, 300, 200, 100	400 (gray only), 200, 150, 100, 75, 50	400/300, 200, 100	400, 300, 200, 100	400, 300, 200, 100
Hardware gray scale	256 grays	black-and-white only	262,144 colors; 64 grays	256 grays	black-and-white only	black-and-white only
Software gray scale	NA	32 grays	NA	NA	37 grays	37 grays
Brightness control	in software only	●	●	●	●	●
Graphics software included	Image Assistant	ScanMan 2.2, Aldus Digital Darkroom*	MicroFrontier's Color It	MicroFrontier's Enhance	ThunderWorks	ThunderWorks
OCR software included	OmniPage Direct	CatchWord Pro*	CTA's ScanReader	CTA's ScanReader	Olduvai Read-It	○
Tested by Macworld Lab	●	●	●	○	●	○
Tech-support rating	good	good	good	good	good	good

● = yes; ○ = no; NA = not applicable. Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and speed of response. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests.

Best result for each test. Shorter bars are better.

Hardware

Caere OmniScan
Logitech ScanMan 32
Mustek Langelo Color
Thunderware LightningScan 400
Thunderware LightningScan Pro 256

Software

Image Assistant GS 1.0
ScanMan 2.2
Photoshop Plug-In
ThunderWorks 1.3.2
ThunderWorks 1.3.2

Scanning Speed

Times, in seconds, for a usable scan of a 5" x 7" gray-scale photo.

Gray-Scale Recognition

Number of gray shades missed from a test strip with 37 gray levels.



with all 68020/30/40 Macs except the LC and LC II. The LightningScan Portable comes with a rechargeable battery that Thunderware says is good for 50 to 100 typical scans. The replaceable battery sits inside an interface box that is considerably smaller than the SCSI interface boxes. For anyone who needs truly portable scanning, away from AC power—such as students who spend loads of time in the library stacks—this is the only choice. At 1.3 pounds (1.6 with the recharger), the weight isn't a major burden, although the entire assembly with cables doesn't make for quick and easy setup.

With AC power, the SCSI scanners work fine with PowerBooks as long as you have a suitable SCSI cable adapter. Note

that all the SCSI scanners use 25-pin D-connectors rather than the larger 50-pin SCSI plugs. All the units now on the market use external termination (some early models of the ScanMan had inconvenient internal, removable termination). Only the LightningScan Pro 256 has a removable SCSI cable and two 25-pin SCSI connectors, making it the most flexible choice for installation—though its SCSI-interface box is a little bulky.



The Logitech ScanMan 32, top, captured fine lines and detail better than its competitors. The Mustek Langelo Color, bottom, was the only unit we tested that can capture color images.

Making Choices

None of the scanners did well enough to merit an Editors' Choice, but if you want a hand scanner to do what they do best—capturing small graphics—select the Thunderware LightningScan Pro 256. For portable scanning, PowerBook users will find the LightningScan Portable acceptable, as long as you don't expect stunning image quality or useful OCR abilities.

ThunderWorks' scanning software may be simple, but it does the job without getting in your way. But beware of Olduvai Read-It, a package that works poorly at best.

If you want OCR, you have to choose the OmniScan, the only scanner able to read text consistently. Caere clearly understands OCR, but the OmniScan suggests that it understands little else. It has many flaws, including its oversize case, a cumbersome scanning process, and poor stitching software.

The Logitech ScanMan 32 and the black-and-white LightningScan models work well for black-and-white graphics. And they save some money. I've seen the ScanMan 32 selling for as little as \$145 from close-out specialists (with basic scanning software but without either Dig-

ital Darkroom or CatchWord Pro).

If none of this admittedly faint praise entices you, consider one upcoming unit. Microtek recently announced a motorized, 24-bit color scanner. A supporting base with rails will guide the scanner for two-pass scanning of 8½-by-11-inch images, with automatic stitching. This base should help make the stitching process work better than with any previous scanner.

Hand scanners have a long way to go before they become as convenient and useful as other desktop peripherals. But when vendors find a way to combine the ability to scan in the tightest corners and the speed to scan with a swipe rather than a slow, deliberate roll, hand scanners will become a desktop mainstay. Apple's new high-speed serial port (GeoPort) along with improved sensor hardware could make such a machine possible. Until then, hand scanners are doomed to remain a reluctant choice for users who cannot afford a flatbed. **m**

Contributing editor and *PowerBook Notes* columnist CARY LU is author of *The Apple Macintosh Book* (Microsoft Press, 1992).

Thunderware	Thunderware
LightningScan Portable	LightningScan Pro 256
510/254-6581	510/254-6581
800/628-0693	800/628-0693
\$459	\$529
serial port	SCSI
2MB/4MB	2MB/4MB
0.6/0.7/0.75	0.6/0.7/0.75
manual	manual
●	●
●	●
400, 300, 200, 100	400, 300, 200, 100
black-and-white only	256 grays or black-and-white
37 grays	64 grays
●	●
ThunderWorks	ThunderWorks
Olduvai Read-It	Olduvai Read-It
○	●
good	good

and accuracy of the company's support technicians. Macworld uses Buyer's choice of either Digital Darkroom or CatchWord Pro.

You're lo



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Software Development Update

PDI

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- **How** – consider the different ways in which the different types of data can be used to answer the research question. Are the data available in a form that can be analysed? Do you need to transform the data in some way? Do you need to use a particular statistical test?
- **Where** – consider the different ways in which the data can be used to answer the research question. Are the data available in a form that can be analysed? Do you need to transform the data in some way? Do you need to use a particular statistical test?
- **What** – consider the different ways in which the data can be used to answer the research question. Are the data available in a form that can be analysed? Do you need to transform the data in some way? Do you need to use a particular statistical test?
- **Why** – consider the different ways in which the data can be used to answer the research question. Are the data available in a form that can be analysed? Do you need to transform the data in some way? Do you need to use a particular statistical test?

If you thought there was no place for color in a conservative communication, it's time to take a look at the front of the enterprise. Consider the spreadsheet, the correspondence, the most successful of those

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EDITED BY JAMES A. MARTIN

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Tektronix Pushes Dye-Sub Color to the Edge

TEKTRONIX HAS ANNOUNCED THE Phaser 480, a dye-sublimation printer for multiplatform network environments that offers full-bleed, 11-by-17-inch output at a reasonable price (for a dye-sub printer) of \$14,995.

The PostScript Level 2 printer's raster image processing firmware enables it to print files as large as 10MB in 1 minute across a network, according to Tektronix. The Phaser 480 includes AppleTalk, parallel, and serial ports, and it supports automatic switching between ports and multiple protocols. EtherTalk, NetWare IPX, or TCP/IP (available as options) are needed to achieve the 10MB throughput.

The Phaser 480 uses Tektronix's Photofine technology to improve the quality of fine lines and text. The printer also supports TekColor Dynamic Correction, which lets you match the Phaser's output to other color printing devices. For example, if your work will be printed on an offset web press, you can add printer characterizations that match the Phaser 480's output with the color produced by a press that follows SWOP (Specification for Web Offset Printers) standards.

Tektronix has included characterizations for other commercial presses, as well as profiles for Electronics for Imaging's EfiColor and Apple's ColorSync color-matching schemes.

The Phaser 480's tabloid-size paper capabilities combined with Photofine and TekColor Dynamic Correction should reduce the number of film proofs a designer needs, according to Tektronix.

The printer's 32MB of memory is expandable to 64MB for image caching and I/O buffers. The Phaser 480, which has a 24MHz AMD 29000 RISC processor, is expected to ship in January. Tektronix, 503/682-7377, 800/835-6100.

—DAN MUSE



SCOTT PETERSON

FreeHand 4.0 Includes All-in-One Palette

ALDUS IS NOW SHIPPING A SIGNIFICANT upgrade to FreeHand, its PostScript-based 24-bit color draw program. FreeHand 4.0 includes, among other useful new features, a simplified interface, improved text handling, multiple-page layout capabilities, and enhanced color management.

Most noticeable in the FreeHand update is the Inspector palette, a floating master panel that combines tools for adjusting a variety of elements and attri-

butes in real time (the Inspector replaces 35 dialog boxes). By combining these tools in one palette, the Inspector palette promises one-stop shopping for tools for easily managing and manipulating text, layout and element attributes (line widths and weights or graduated fills, for instance), and document setup and paragraph controls, among other items.

FreeHand's color-support improvements include the abilities to adjust CMYK colors in the color mixer in real time and to apply colors to an object by dragging and dropping the desired color from the color mixer. FreeHand now shares the same color library as Aldus PageMaker 5.0 for improved integration between the programs. However, neither FreeHand nor PageMaker offers a built-in color-management system link.

FreeHand 4.0 enables you to input and kern text directly in a text box and flow text between linked boxes, containers, or shapes. It also adds copyfitting controls and a hyphenation dictionary (it's the same as PageMaker 5.0's).

The program's new live pasteboard (56 by 56 inches) enables you to place objects and text across multiple pages with multiple columns—giving FreeHand users the ability to perform limited page layout (a capability Adobe added to Illustrator 3.0 in 1990). FreeHand's \$595 price and \$150 upgrade fee are the same. Aldus, 206/628-2320.—J.A.M.



FreeHand 4.0's enhanced Color and Tints palettes enable you to mix, drag, and drop colors directly onto objects.

PhotoFlash: Apple's Page-Layout Companion Enters the Picture

APPL PHOTOFLASH, JOINTLY DEVELOPED by Storm Technology and Apple Computer, is a page-layout companion product for QuarkXPress and Aldus PageMaker that combines acquisition, adjustment, and placement of photos in one application. Its integrated image browser searches folders of images, automatically creating and displaying thumbnail views to which you can add captions for easy identification. You can even access images directly from Kodak Photo CDs.

Once you've found an image you want, you can drag and drop it into your page-layout document or use a preset or user-defined script to automatically manipulate the image during the placement process.

PhotoFlash can handle RGB, CMYK, and gray-scale images. It supports Photoshop plug-ins as well as a wide variety of graphics formats—including PICT, TIFF, JPEG, EPS, DCS, native Photoshop, and Photo CD—and it can convert images from one format to another, singly or in batch mode. A set of automated tools lets you erase blemishes; set brightness and contrast; align crooked scans; and perform other enhancements such as sharpen, blur, crop, resize, and rotate. And you can preview your adjustments in real time before actually applying them to an image.

PhotoFlash's AppleScript support lets users automate operations such as manipulating images, converting between file formats, and creating contact sheets of images for placement into any AppleScript-savvy application. The first release of PhotoFlash will include ten scripts.

Because PhotoFlash uses Storm's image-compression and virtual memory schemes, disk space and memory require-

ments are relatively low—it can work on an 8MB Mac (with 3.5MB of available RAM). PhotoFlash is expected to be available by late November. \$279. Apple Computer, 408/996-1010.—CATHY ABES

Hewlett-Packard to Ship a Better ScanJet

HEWLETT-PACKARD IS SCHEDULED to begin shipping in November a 24-bit color flatbed scanner that costs 25 percent less than the two-year-old ScanJet IIc it replaces, while promising speed, resolution, and software enhancements.

The ScanJet IIcx retails for \$1179, while the discontinued IIc listed for



\$1599. The IIcx ships with HP's DeskScan II 2.0 software, which now offers interpolated scanning resolutions up to 1600 by 1600 dpi on a ScanJet IIcx or IIc or up to 1200 dpi on the ScanJet IIp gray-scale scanner. The ScanJet IIcx's true optical resolution is 400 by 800 dpi.

The revised software also enables you to automatically scan up to 50 pho-

IN BRIEF

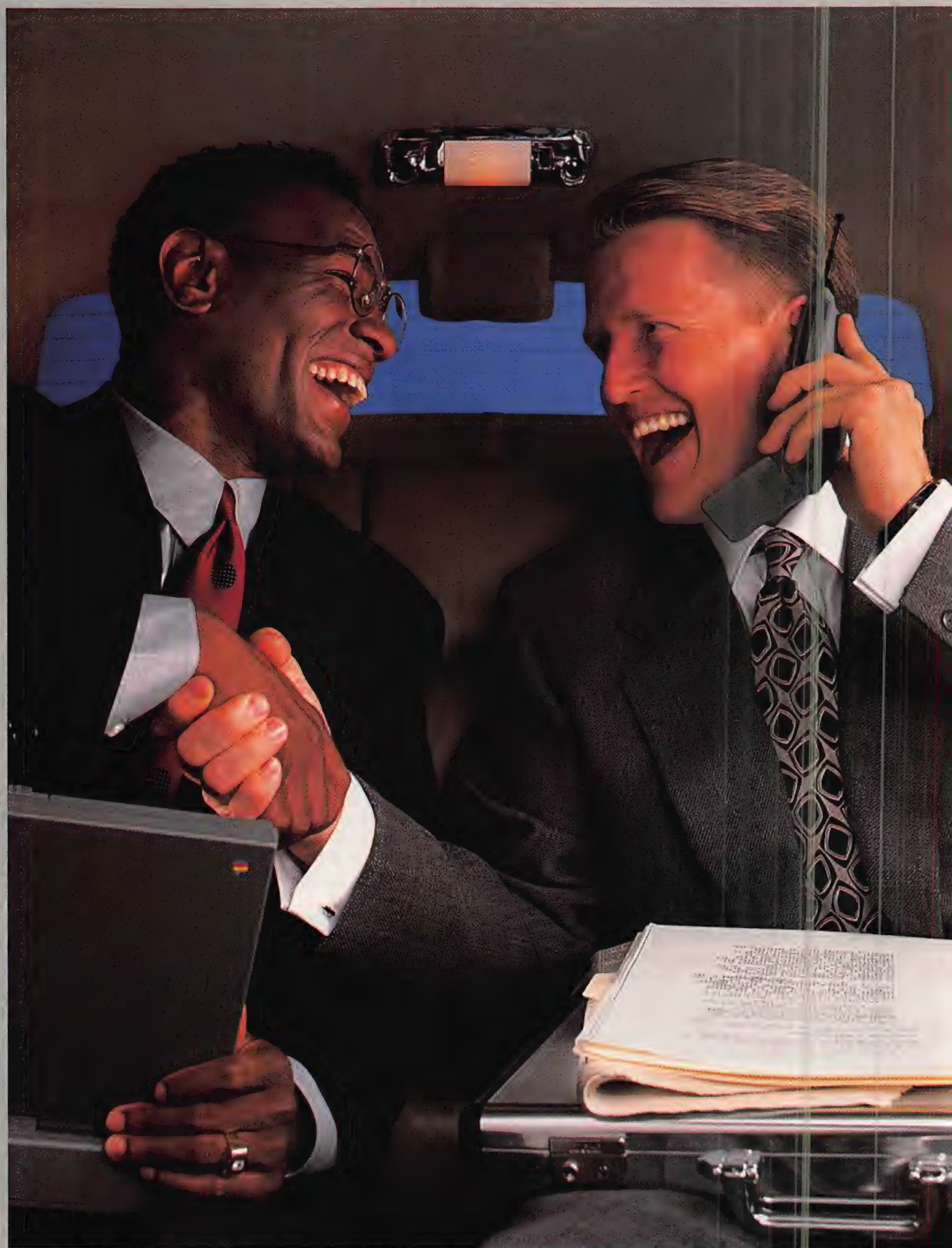
■ **Two-Handed Tablet** Wacom Technology's latest graphics tablet, the UD-1212R, enables you to use two input devices, such as a pressure-sensitive pen and a tracking puck, simultaneously—one for drawing, the other for selecting menus or other tasks. But software applications must be updated to accept dual-cursor input; at press time, no software developers have announced plans to support this function. The \$749 graphics tablet also includes a customizable menu strip and features improved input speed. 206/750-8882, 800/922-6613.

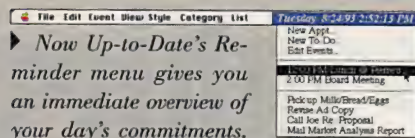
■ **A Better TrapWise** Aldus TrapWise 2.0 includes several new prepress controls, including image trapping, color-separation abilities, batch processing, and the ability to trap multiple-page PostScript files that conform to Adobe's Document Structuring Convention (DSC) 3.0. The program costs \$4995; upgrade price is \$1000. 206/622-5500.

■ **Enhanced Streamline** Version 3.0 of Adobe Streamline (\$199), which is expected to ship in October, includes both image- and Bézier-editing controls; color support (to convert color images into 256-color or 16-level gray-scale files); direct scanner access; preconversion editing; and Photoshop plug-in support. Compatible file formats include Photoshop 2.0 and 2.5, PICT, TIFF, Illustrator (all versions), and DXF. Upgrade price is \$49. 415/961-3769.

tographs by stacking them into the optional automatic document feeder (\$559). ScanJet IIc and IIp owners can upgrade free to DeskScan II 2.0 via AppleLink or by calling a special phone number (800/227-8164) and ordering a disc—you pay shipping and handling charges only.

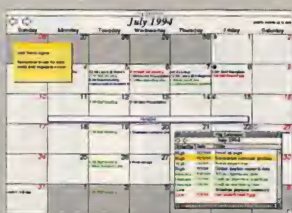
The ScanJet IIcx can scan gray-scale images and text almost twice as fast as the IIc, according to the company, although scanning time for color images remains roughly the same. HP has also introduced a new transparency adapter; it's due to ship in January for \$759 but works only with the IIcx. Hewlett-Packard, 208/323-2551, 800/722-6538.—J.A.M.





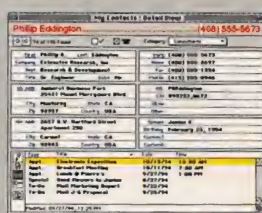
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GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

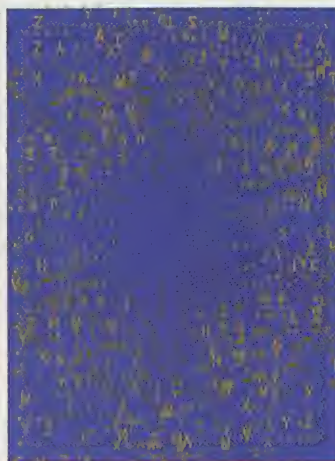
Artist: Steven Lyons is a free-lance illustrator living in Fairfax, California, whose work has appeared in numerous publications, including *American Illustration*, *Communication Arts*, and *Print*. He has produced images for such clients as Apple, Intel, MCI, and *Newsweek*. He is currently producing a series of illustrations promoting the PowerPC processors.

How It Was Done: For the image that opens our feature on multiuser databases, Lyons combined the hard-edged look typical of Illustrator with the softer, more diffused effect that Photoshop can provide. He created the background with the yellow-green letterforms in Illustrator; after importing this into Photoshop, he used the Gaussian Blur and Noise filters to soften the letters and make them appear to be fading into infinity.

In Photoshop he created the striped texture maps for the tower, which he built in Ray Dream Designer's Light-Forge module and is composed of two lathed objects: a cylinder—which was duplicated three times—and the cone-shaped base. Next, the texture maps were applied to the tower, the tower was placed in the scene, and lighting was added. Finally, the scene was rendered at high resolution, a process that took about three hours. The rendered image was antialiased and saved as a PICT file.

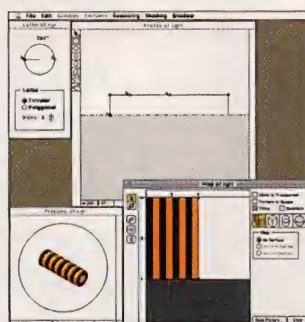
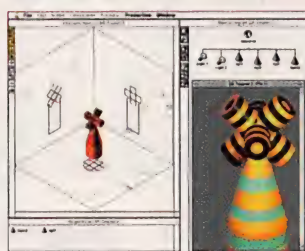
Lyons then scanned his original pencil sketch into a new Illustrator file for use as a template. After placing the Photoshop file of the tower and background into it, he pasted the image of the computer user—previously created in Illustrator—into the Photoshop file, duplicated it three times, flopped two of the copies (using the reflect tool), and placed them appropriately. The large red letters, also created in Illustrator, were made into outlines, then imported into Adobe Dimensions and extruded, and saved as Illustrator files. After pasting the letters into the main illustration, he created the additional elements in Illustrator.

The 9MB image took about 24 hours to create. **m**



1 In Illustrator, the background began as a blue field with yellow-green letters placed over it. Lyons saved the file in Illustrator 3 format (because Photoshop does not rasterize Illustrator 5 files correctly) and then opened and rasterized it in Photoshop, where he applied the Gaussian Blur and Noise filters. He saved the file in Photoshop 2.5 format.

3 The tower was constructed in Ray Dream Designer's Light-Forge module and is composed of two lathed objects: a cylinder—which was duplicated three times—and the cone-shaped base. Next, the texture maps were applied to the tower, the tower was placed in the scene, and lighting was added. Finally, the scene was rendered at high resolution, a process that took about three hours. The rendered image was antialiased and saved as a PICT file.



2 The striped texture maps that would be applied to the intersecting cylinders of the tower were created in Photoshop and saved as 8-bit PICT files.

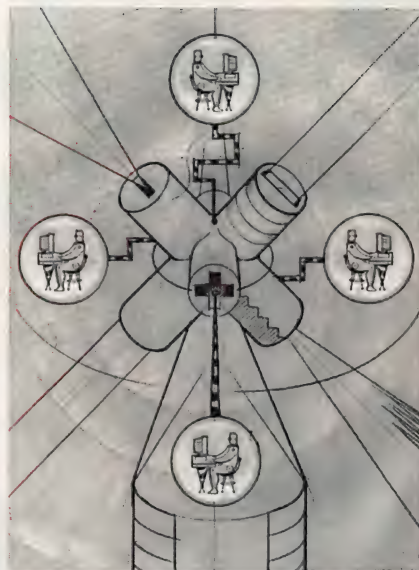
THE TOOLS

Hardware: Macintosh IIfx with 20MB of RAM; 120MB internal Mass Micro DiamondDrive hard drive; 210MB external hard drive; SuperMac 20" Trinitron color monitor; Seiko ColorPoint PS printer; Wacom 12" by 12" tablet; Microtek ScanMaker II.

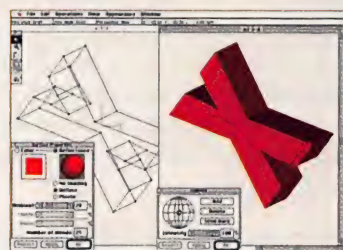
Software: Adobe Illustrator 5.0; Adobe Photoshop 2.5.1; Ray Dream Designer 2.0; Adobe Dimensions 1.0.



5 The image of the computer user began as a pencil sketch, which was scanned and then opened in Illustrator. Lyons used Illustrator's pen tool to draw the final figure from his scanned sketch.



6 The pencil sketch of the whole illustration was scanned and opened in Illustrator for use as a template. Then, after placing the EPS file of the background over it, Lyons pasted in the 3-D letters and computer-user images. Finally, the other details—smaller letters, fine lines, and border—were added.



4 The large red three-dimensional letters began as 2-D letters in Illustrator. Lyons used the Create Outlines command (under the Type menu) to convert them to paths so they could be imported into Adobe Dimensions and transformed into 3-D objects. After rotating the letters to their correct positions, he rendered and exported them as Illustrator files.

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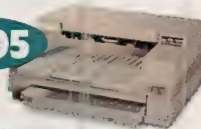


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Clip Art's GREATEST HITS

*Macworld rates the best
clip art in ten categories*

Clip art is changing. While royalty-free digital images have been around practically as long as the Mac, today's images are more sophisticated and offer better quality. In fact, clip art has matured in a number of ways:

- A wide range of subjects is available. The first Mac clip art collections pretty much stayed with traditional subjects: holidays, seasons, food, borders, and travel. These days there are more companies selling clip art, and to be competitive some are specializing in such focused subject areas as medicine, maps, military images, and backgrounds and textures.

- Image quality has improved. A number of companies have retained some excellent artists who create images with personal flair. A few traditional art styles have been revived as well (digital woodcuts are in vogue this year).

- Color is here. Numerous companies now offer color as well as black-and-white images in a variety of formats and resolutions. Color EPS collections use the CMYK (cyan, magenta, yellow, black) palette, which enables you to print them on a color PostScript printer or as four-color separations. Scanned color TIFF images, such as the backgrounds offered by Artbeats, D'pix, and others, come in various resolutions for different types of output. Image resolution typically ranges from low (75 dpi) to high (270 dpi). All images in the collections reviewed here are black-and-white, unless otherwise noted.

- CD-ROM clip art collections are proliferating. CDs are more convenient than armfuls of floppy disks, and many CDs include search utilities and image browsers to help you view and retrieve images. Many companies offer their collections on both CD-ROM and floppies.

To help you choose among the vast amount of clip art available, I've selected the best collections in ten categories (including the ever-popular Miscellaneous). Companies that didn't make my list of favorites but offer high-quality artwork are listed as Also Recommended. As I reviewed collections from more than 70 companies, I looked for overall image quality (blotchy scans or amateurish drawings were out) and value (one company offered high-quality EPS graphics, but charged \$80 for only 12 images).

BY ERFERT FENTON



ANIMALS



Art Parts, Animals

Art Parts, 714/771-6754. *Format*: EPS. *Media*: Floppies. *Price*: \$49.50 (50 images).

Art Parts' animals have a lighthearted charm that's rare in the clip art world. The collection's 50 creatures, which range from ants to a blue whale, are rendered in a bold, woodcut style.



Totem Color Clip Art: Birds

Totem Color Clip Art: Fish

Totem Graphics, 206/352-1851. *Format*: EPS, *Illustrator*, *FreeHand*; *color*. *Media*: Floppies or CD-ROM. *Price*: *Birds* \$125 (96 images); *Fish* \$125 (96 images); *18-subject CD-ROM* \$995 (1440 images).

Of all Totem's artwork, I like the Birds and Fish collections best (the Insects set is good, too, but my publishing projects rarely call for earwigs, beetles, or fleas). The draw-

ings are fairly realistic, and the collections cover exotic creatures (scarlet ibis, leafy sea dragon) as well as common ones (robin, goldfish).

ALSO RECOMMENDED

ClickArt Studio Series Animals and Nature

T/Maker Company, 415/962-0195. *Format*: EPS; *color*. *Media*: Floppies. *Price*: \$99.95 (150 images).



MEDICAL / HEALTH



Super Anatomy Collection

TechPool Studios, 216/382-1234, 800/777-8930. *Format*: EPS; *color*. *Media*: Floppies. *Price*: \$229.

LifeArt's collection consists of anatomical images of the human circulatory, skeletal, muscular, digestive, endocrine, reproductive, nervous, and urinary systems, as well as external views. Many files can be ungrouped to form several drawings (skeletal and muscular components of a drawing

can be separated, for example). TechPool also offers Health Care I and Emergency Collection (\$229 each), as well as Transverter (\$99.95), a utility that converts EPS graphics to PICT or paint formats.

ALSO RECOMMENDED

Health Care

Metro ImageBase, 818/881-1997, 800/525-1552. *Format*: TIFF. *Media*: Floppies. *Price*: \$74.95 (100 images).

MediClip

Alpha Media, 310/315-3472, 800/736-1567. *Format*: EPS, TIFF, *paint*, or PICT. *Media*: Floppies. *Price*: \$99 (100 images); *two volumes* \$159 (200 images).

BORDERS / ORNAMENTS



DigitArt Clip Art Collection, Volume 23, Borders & Ornaments

Image Club Graphics, 403/262-8008, 800/661-9410. Format: EPS; color and b&w. Media: Floppies or CD-ROM. Price: Borders & Ornaments \$99 (200 images); ArtRoom CD-ROM \$799 (9300 images; includes browser utility).

This collection offers something for every taste. Decorative ornaments are generally in the style of old-

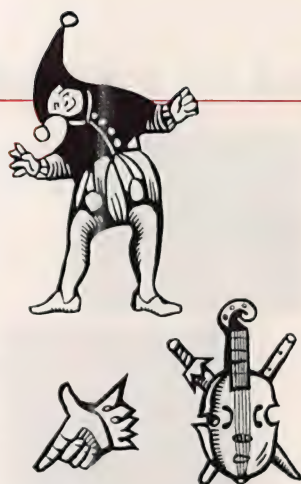
fashioned woodcuts or engravings, featuring flowers, flourishes, cupids, and the occasional oddity (a housefly, some flying saucers, and so on). An interesting and amusing mix.



General Collection II

[metal] Studio, 713/523-5177, 800/858-5254. Format: EPS. Media: Floppies. Price: \$99 (92 images).

[metal] Studio's artists have created a refreshing collection that combines a number of styles, from looping line drawings to digital woodcuts. Overall, the collection has a lively, modern feel not found in many clip art packages. General Collection I (\$99, 167 images) is a worthy companion, too.



Typographers' Ornaments series, Will Bradley

Underground Grammarian, 609/589-6477. Format: TIFF. Media: Floppies. Price: \$25 (39 images); ten TIFF albums \$215 (EPS collections also available for \$49.50 each or \$400 for ten volumes).

This is one of several superb collections offered by Underground Grammarian, an outfit that sells old-fashioned ornaments it originally digitized for its own publications. For your information, Will Bradley (1868-1962) was one of America's finest typographic artists.

ALSO RECOMMENDED

ClickArt Studio Series Artistry & Borders

ClickArt Color Graphics for Presentations

T/Maker Company, 415/962-0195. Format: EPS; color and b&w. Media: Floppies. Price: Artistry & Borders \$99.95 (325 images); Color Graphics for Presentations \$99.95 (250 images).

WetPaint Printer's Helper

Dubl-Click Software, 818/888-2068, 800/359-9079. Format: Paint. Media: Floppies or CD-ROM. Price: Printer's Helper \$89.95 (117 images), The Wet-Set CD-Rom \$349.95 (1000 images).

SYMBOLS



AdArt Series, International Symbols & Icons, Vol. 1

Innovation Advertising and Design, 802/879-1164, 800/255-0562. Format: EPS. Media: Floppies or CD-ROM. Price: \$99 (350 images); AdArt: Clip Art for Advertising CD ROM \$999 (2700 images).

Innovation Advertising and Design has come up with a choice selection of symbols for packaging, signs, maps, travel, business, sports, religion, and other subjects. The company also offers well-known corporate logos, real estate graphics, flags of the world, credit cards, recycling and environmental symbols, and assorted ornaments.

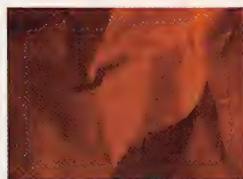
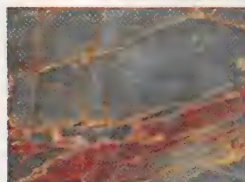


Images with Impact: Accents & Borders

3G Graphics, 206/774-3518, 800/456-0234. Format: EPS, PICT; color and b&w. Media: Floppies or CD-ROM. Price: Accents and Borders 2 \$149.95 (300 images); Images with Impact CD-ROM \$499.95 (1100 images; 3600 images if components separated).

Stylish, nicely rendered images in the following categories: symbols, decorative accents, holidays, tiles, borders, and frames. Ornaments include everything from cowboy gear to Celtic designs, in drawing styles that vary from woodcuts to Art Nouveau.

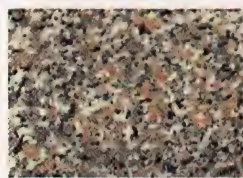
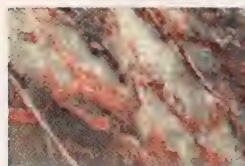
BACKGROUNDS



Folio 1 Media Kit

D'pix, 614/299-7192, 800/238-3749. *Format:* TIFF; 24-bit color. *Media:* Floppies or CD-ROM. *Price:* \$299.95 (100 images).

Fill your screen with oatmeal. Or marble or mahogany, if you prefer. This set of realistic backgrounds consists of 75-dpi, 9-by-12-inch images in the following categories: abstracts, fabric, food, marble, masonry, metal, nature, novelties, paper, and wood. Each file takes up about 2MB. This is an excellent collection for desktop publishing or presentations.

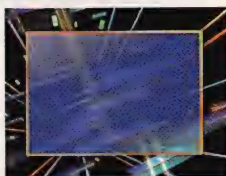


Marble & Granite

Artbeats, 503/863-4429. *Format:* TIFF, PICT; 8-bit and 24-bit color and b&w; 75 dpi and 270 dpi. *Media:* CD-ROM. *Price:* \$349.

For centuries, marble has symbolized elegance and opulence. There's no reason your

publications or presentations should be lacking in same, now that these beautiful backgrounds are available in digital format. The files in this two-CD set come in a variety of formats, dimensions, and resolutions, from laser-printer quality to 24-bit, 270-dpi TIFF images. Artbeats also offers other great background collections for multimedia and publishing.



ProGraphix, Volume 1

East West Distribution, 213/848-8436, 800/833-8339. *Format:* TIFF, PICT; color. *Media:* CD-ROM. *Price:* \$295 (300 images; includes browser utility).

This vibrant collection of high-tech backgrounds in-

cludes glowing planets; metallic heads; marble patterns; and a variety of telephones, computers, musical instruments, glass filters, and globes. The images are colorful and dynamic and would be ideal for multimedia presentations.



Wraptures One Wraptures Two

Form and Function, 619/536-9999, 800/843-9497. *Format:* PICT; 8-bit and 24-bit color. *Media:* CD-ROM. *Price:* *Wraptures One* \$95 (130 images); *Wraptures Two* \$95 (150 images).

Some of the color files in these two collections are full-screen backgrounds; others can be combined as tiles to make backgrounds of various sizes. Each image comes in several dimensions and resolutions. Backgrounds include stone, fur, foliage, paper,

metal, glass, and—my favorite—chocolate frosting.

ALSO RECOMMENDED

Auguste Racinet—Historic Ornaments Vol. 1

The Classic Archives Company, 203/847-0930. *Format:* Scitex CMYK (can be saved as color EPS, TIFF, or Photoshop files; includes high- and low-resolution versions). *Media:* CD-ROM. *Price:* \$249 (25 images, 8-by-12-inches).

Material World 1 and 2

Cameo Interactive (available through East West Distribution, 213/848-8436, 800/833-8339). *Format:* PICT; color. *Media:* CD-ROM. *Price:* Vol. 1 \$99 (200 images); Vol. 2 \$99 (260 images).

Screen Caffeine

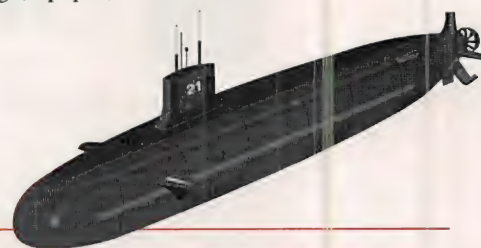
Neoview, 512/346-8228, 800/880-8888. *Format:* PICT; color. *Media:* CD-ROM. *Price:* \$99.

MILITARY



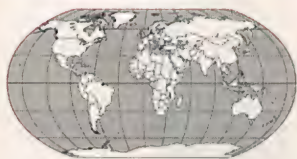
Federal Clip Art III: Naval Combat Art

One Mile Up, 703/642-1177, 800/258-5280. *Format:* EPS; color and b&w. *Media:* Floppies or CD-ROM. *Price:* Naval Combat Art \$345 (250 images); National Archives CD ROM \$1699 (collection of 12 Federal Clip Art packages).



One Mile Up's Naval Combat Art collection features skillfully drawn images of ships, satellites, submarines, aircraft, medals, seals, insignia, signal flags, and other naval subjects. The company offers additional military artwork, including air combat; ground combat; and army, air force, and navy insignia.

MAPS / REGIONS



MapArt, Volumes 1 to 4

Cartesia Software, 609/397-1611, 800/334-4291. Media: Floppies or CD-ROM. Format:



EPS, PICT, Illustrator. Price: Vol. 1 \$179; Vol. 2 \$99; Vol. 3 \$49; Vol. 4 \$99; MapArt Bundle CD-ROM (Vols. 1 through 4) \$379; MapArt World

Data Bank CD-ROM (countries in Illustrator format) \$299.

Cartesia Software (formerly MicroMaps Software) offers maps that range from global views to metropolitan areas. Volume 1, USA & International (revised to reflect new boundaries in the former USSR), includes countries, states, provinces, and major cities. Volume 2, U.S. States by County, presents each county as a separate graphic object for editing. Volume 3, Global Perspectives, shows 18 views of the globe. Volume 4, Metro Areas—USA, details 25 metropolitan areas.



Federal Clip Art: Diplomatic Clip Art

One Mile Up, 703/642-1177, 800/258-5280. Format: EPS; color and b&w. Media: Floppies or CD-ROM. Price: Diplomatic Clip Art, \$395 (360 images); National Archives CD ROM \$1699 (12 collections).

One Mile Up specializes in images for the federal government and related agencies. This collection offers national



flags (color) and coats of arms (black-and-white and color) for 200 countries. One Mile Up also sells State Art, a collection of U.S. state maps, seals, and flags, for \$295 (250 EPS images).

ALSO RECOMMENDED

Cliptures, Volume 4, World Flags

Dream Maker Software, 303/762-1001, 800/876-5665. Format: EPS; color and b&w. Media: Floppies. Price: \$129.95 (300 images).

RELIGION



Religion

Metro ImageBase, 818/881-1997, 800/525-1552. Format: TIFF. Media: Floppies or CD-ROM. Price: Religion \$74.95 (100 images); Metro ImageBase on CD \$149.95 (2000 images, TIFF and EPS).

The primarily Christian and Judaic images, includ-

ing churches, holidays, people, religious objects, silhouettes, headings, and symbols, in this collection are drawn in a clean, straightforward style.

ALSO RECOMMENDED

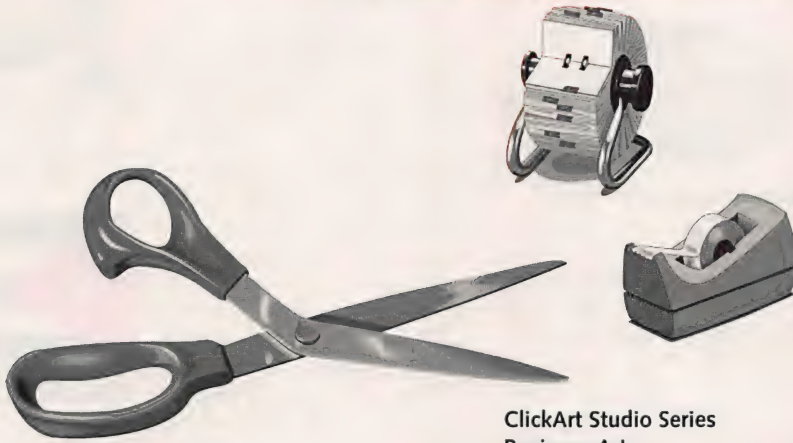
DavkaGraphics. EPS: Judaica

Davka Corporation, 312/465-4070, 800/621-8227. Format: EPS. Media: Floppies. Price: \$79.95 (65 images).

ProArt Professional Art Library Portfolio

Multi-Ad Services, 800/447-1950, 309/692-1530. Format: EPS. Media: Floppies or CD-ROM. Price: Religious images \$64 (92 images); Religious Images CD-ROM \$400 (3000 images).

BUSINESS / PROFESSIONS



ClickArt Studio Series Business Art

T/Maker Company, 415/962-0195. Format: EPS; color and b&w. Media: Floppies. Price: \$99.95 (200 images).

This is a well-rounded selection of office items, computers, symbols for various occupations, and businesspeople (and, for some reason,

a bicycle). Most of the office equipment is rendered in a detailed, realistic style.



Images with Impact: Business 1
3G Graphics, 206/774-3518, 800/456-0234. Format: EPS; b&w (color images included on CD-ROM). Media: Floppies or CD-ROM. Price: Business 1 \$99.95 (175 images); Images with Impact CD ROM \$499.95 (1100 images; 3600 images if components separated).

Computers, office items, travel, communications, finance, businesspeople, and symbols for various profes-

MISCELLANEOUS



ARROglyphs, Environment Volume 1

ARRO International, 201/746-9620. Format: EPS. Media: Floppies. Price: \$199.99 (200 images).

Save a tree—blow up your laser printer. Short of that, you might want to add environmentally conscious mes-

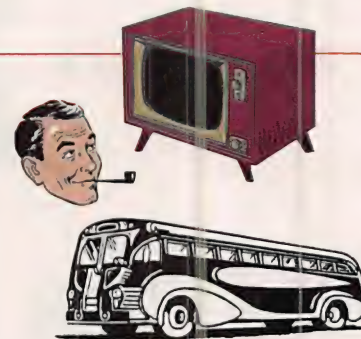
sages to your publications with this striking collection. The topics include pollution, recycling, and endangered species; and the artistic styles encompass woodcuts, line and brush drawings, and geometric images. And, yes, the manual is printed on recycled paper.



**Designer's Club
Electronic Clipper
ArtAbout series (Sports,
Healthcare, Food, and Seasons)**
Dynamic Graphics, 309/688-8800, 800/255-8800. Format: EPS, TIFF. Media: Floppies or CD-ROM. Price: Designer's Club \$49.50 per month (50 EPS

images); Electronic Clipper \$67.50 per month (70 EPS and TIFF images); ArtAbout \$129 per volume.

Dynamic Graphics has been around since the old days, when clip art came on paper. It provides several clip art options, including monthly subscriptions to two art libraries, Designer's Club and Electronic Clipper. Monthly collections offer seasonal and holiday themes, advertising banners and headings, and miscellaneous images. Theme packages feature subjects such as borders, food, headings, and holidays. The artistic styles vary but are generally in a traditional, realistic vein.



**DigitArt Clip Art Collection,
Volume 21, Fabulous Fifties**
Image Club Graphics, 403/262-8008, 800/661-9410. Format: EPS; color and b&w. Media: Floppies or CD-ROM. Price: Fabulous Fifties volume \$99 (250 images); ArtRoom CD ROM \$799 (9300 images; includes a browser utility).

Gee, things were swell in the fifties! Remember those big, bulbous cars; malt shops; bobby socks; carhops; hula hoops; spaceships; hi-fi; "Leave It to Beaver"; the threat of nuclear annihilation?

This collection from Image

sions make up this practical collection. Also included are hands typing, holding floppy disks, and so on.



Business Graphics

Computers & Technology

Metro ImageBase, 818/881-1997, 800/525-1552. *Format:* TIFF. *Media:* Floppies or CD-ROM. *Price:* *Business Graphics* \$74.95 (100 images); *Computers & Technology* \$74.95 (100 images); *Metro ImageBase CD-ROM* \$149.95 (2000 images, TIFF and EPS).

Office equipment, money, industry, computers, business-

men pointing at charts, and a host of industrious professionals drawn in the realistic style of traditional clip art make up this series. These images won't win you any prizes for the most avant-garde brochure, but they're just the thing for adding a solid, professional feel to your publications. At \$149.95, the CD-ROM is a great deal.

ALSO RECOMMENDED

Clipables: The EPS Graphics Library 2.0

C.A.R., 314/721-6305, 800/288-7585. *Format:* EPS. *Media:* Floppies or CD-ROM. *Price:* \$299.95 (1200 images).

Club brings back that wonderful decade with authentic fifties images of everything from bathing beauties to space-age furniture. Neato!



KidBag

DS Design, 919/319-1770, 800/745-4037. *Format:* EPS, TIFF; color and b&w. *Media:* Floppies. *Price:* \$99 (130 images); \$129 (130 images plus 3 fonts).

Ever try to draw like a kid? It's hard. That's why DS Design has employed the masters of this genre—kids between the ages of 5 and 11—to create a collection of charming illustrations. Use them in your child's birthday invitation, a school newsletter, or wherever you need a touch of childlike whimsy. Categories include people, animals, sports, food, and travel. Crayon, paint, and marker PostScript fonts are also available.



The Santa Fe Collection, Professional version

RT Computer Graphics, 505/891-1600, 800/245-7824. *Format:* EPS. *Media:* Floppies.



Price: \$179 (625 images, plus font; includes browser utility); *sample disk* \$15; *MacPaint version* \$49.

Many of the images—cacti, pottery, borders, geometrics—depict the fanciful abstract designs of the ancient Mimbres Indians; others are in a more realistic style. This collection gets bonus points for including only one coyote with a bandanna.

BEST OVERALL COLLECTIONS



The following clip art collections are the overall cream of the crop, offering the best quality and most interesting artwork at reasonable prices.

ClickArt Studio Series Animals, ornaments, sports, business collections in color EPS format. **Company:** T/Maker Company, 415/962-0195. **List price:** \$99.95 per volume.

Electronic Clipper Subscription service; miscellaneous images in TIFF and EPS format. **Company:** Dynamic Graphics, 309/688-8800, 800/255-8800. **List price:** \$67.50 per month.

Images with Impact Borders, ornaments, business, and people in color and b&w, EPS and PICT format. **Company:** 3G Graphics, 206/774-3518, 800/456-0234. **List price:** \$99.95 to \$129.95 per volume; CD-ROM \$499.

Metro ImageBase Borders, ornaments, business, fitness, food, seasons, religion, travel, and sports volumes in TIFF and EPS format. **Company:** Metro ImageBase, 818/881-1997, 800/525-1552. **List price:** \$74.95 per volume; CD-ROM \$149.95.

Typographers' Ornaments Old-fashioned printer's ornaments in TIFF format. **Company:** Underground Grammarian, 609/589-6477. **List price:** \$25 per volume; ten TIFF albums \$200; EPS volumes also available for \$50 each.

ALSO RECOMMENDED

Visual Delights

SunShine Graphics, 512/453-2334. *Format:* TIFF. *Media:* Floppies or CD-ROM. *Price:* *Floppies* \$39 per volume (30 to 170 images); *CD-ROM* \$333 (5800 images; includes search utility, browser, graphics program). *An eccentric but enjoyable collection of miscellaneous images in categories such as Mayan ruins, Scandinavian designs, monsters, plants, and borders; most hail from old-time prints.* **m**

ERFERT FENTON is a *Macworld* contributing editor and coauthor of *Canned Art: Clip Art for the Macintosh* (Peachpit Press, 1992).



i imagine a desktop printer designed to keep



The DEClaser 1152. The desktop network printer designed to handle Mac and PC users at the same time.

Finally. The PostScript™ Level 2 printer you've been waiting for has just pulled in. Right on the desktop. And at \$699, right on the money.

The DEClaser 1152. The extraordinary new printer that truly is designed to handle anything.

Mac users. PC users. All at the same time. And with all the performance you need. Like 4 ppm print speed. Crisp 300 dpi resolution. Built-in PostScript Level 2 and HP® Laser Jet® II (HP PCL4) support. And up to three hot I/O ports for simultaneous connection



The DEClaser 1152 includes:

- 4 ppm, 300x300 dpi
- 17 resident PostScript fonts
- Built-in PostScript Level 2, HP PCL 4 support
- 2 MB RAM (upgradeable to 4MB)
- 13.8" W x 15.9" D x 8" H

of Macs and PCs mean you can print from multiple sources. No switches to flip. No cables to disconnect. The DEClaser 1152 does it all automatically. And reliably. With its rugged Canon® LX engine, the DEClaser 1152 is built to just keep rolling along. Delivering page after page of superb print quality. How can you get on board with the DEClaser 1152? Just get on the telephone. Today. And place your order or get the name of your local distributor.

Call 1-800-DIGITAL.

PUTTING IMAGINATION TO WORK

everyone on track.

digital™

EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

New Twist on Helix

IF YOU USE THE DATABASE MANAGER Helix Express as a warehouse for storing, distributing, and tracking documents created by other applications, your database is probably bulging at the seams. Helix Express 2.0 has some good news for you: it can manage your warehouse using pointers to external files, without incorporating the files inside the database.

Other Helix Express news: version 2 can generate lists asynchronously—in other words, it can execute more than one query concurrently. To query from a form instead of from the search window, you can use the new “cold” query feature to specify search terms in multiple fields before the query begins to execute. Text fields can be indexed to speed searching on note fields. Version 2 also provides an easy way to create labels and other reports with records that appear side by side.

For more on Helix, see “Databases That Work” in this issue. Helix Express 2.0 (\$439) should be shipping by the time you read this. Multiuser and run-time pricing depend on the number of users. Helix Technologies, 708/465-0242.—D.L.

Calendar/Contact Combos

ADVANCED SOFTWARE IS KEEPING UP with the times. Companies that market a calendar program are scrambling to ship a complementary contact manager, and vice versa: Now Contact will join Now Software's Now Up-to-Date; Pastel is shipping a contact-manager add-on for DayMaker; and the DateBook companion to Aldus's TouchBase has been shipping for a while. The key to all this walking in pairs is that the two halves communicate—for example, the calendar



ANDREW FAULNER

displays a list of meetings you've recently had with someone you look up in the contact manager, or you retrieve a contact's phone number when you're ready to schedule a meeting in the calendar.

So it's no surprise that Advanced Soft-

ware is coming out with DateView to share information with Advanced's long-standing contact manager, InTouch. DateView lets you control how many days and weeks are visible, categorize and filter events, and set reminders. InTouch and DateView are \$99.95 each. Advanced Software, 408/733-0745.—D.L.

A screenshot of a software dialog box titled "Edit Calendar Entry". It contains various fields for scheduling an event, including date, time, duration, category, priority, and reminder settings. A text area at the bottom contains the message "Negotiation with Tech. Corp." and there is a checkbox for "Attached Record: Tech Corp.".

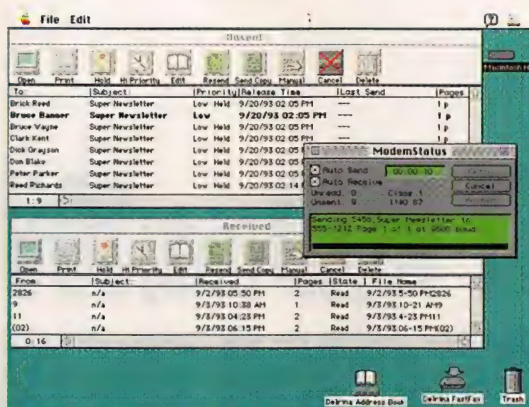
Advanced Software's DateView is able to associate events with records from Advanced's contact manager InTouch.

Delrina Ships Fax for Macs

DELRINA'S NEW FAX PRO SOFTWARE is designed for heavy fax demands. It offers a system of four baskets—in basket, out basket, sent basket, and a basket for faxes that get hung up during trans-

mission—to simplify batch faxing. Fax Pro's address book can store rules such as what time to send a fax to a recipient, and supports everything from numbers within your building to international numbers with a variety of prefixes and suffixes. When you travel, you can tell Fax Pro to adjust for where you are—for example, what area code you are in, or what prefix to dial to get outside the building you are visiting.

Fax Pro can antialias incoming faxes for easy on-screen reading. It includes Caere's AnyFax optical character recognition engine for converting faxes into text (though it may not do you much good—see "OCR: The Recognition You Deserve," *Macworld*, November 1993), as well as a text editor for creating



Fax Pro maintains a comprehensive filing system for incoming and outgoing faxes and makes it easy to batch-send faxes to many addresses.

faxes, which supports reusable stationery and can bundle multiple external documents into one fax document. Fax Pro is shipping for \$129. Delrina, 416/441-3676.—D.L.

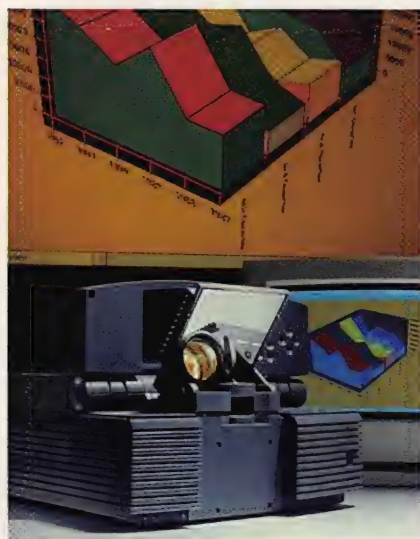
Hernia-Free Presentations

SICK OF CARRYING AROUND AN OVER-head projector? Is your LCD panel too dim? Proxima is developing three presentation displays that combine an LCD panel and an overhead projector. With a Proxima Desktop Projector and a Macintosh, you need only a screen to make presentations. Proxima claims the three Projectors, which weigh between 18 and 20 pounds and fit in an airplane's overhead compartment, produce images up to four times brighter than currently possible with a separate LCD panel and overhead projector.

The Desktop Projector 2300 (\$4995) uses color-stripe supertwist LCD technology and displays 226,000 colors. The 2700 (\$7995) and 2800 (\$8995) models both offer active matrix video and display 2 million colors, and the 2800 accepts NTSC, PAL, and SECAM video input and includes stereo speakers in its case.

The Desktop Projectors, which Proxima says will ship in January, also work with Proxima's Cyclops pointer, a wireless mouse. Proxima, 619/457-5500.

—JOANNA PEARLSTEIN



Proxima's Desktop Projector series combines an LCD projection panel with an overhead projector. The 2800 model has speakers built into the case.

Nisus Strives for More with 4.0

THE SOPHISTICATED WORD PROCESSOR Nisus is being upgraded to Nisus Writer 4.0, with changes ranging from cosmetic improvements such as modern-looking three-dimensional color buttons to major new functionality such as a table editor.

Nisus Writer 4.0's indexing will support references that span two or more pages and, for electronically published documents, will let you jump from an index entry to the correct page. The graphics window will provide 8-bit color and numerous image-editing filters. Apple events will support importing live expressions from the mathematical typesetting program MathType, which will

IN BRIEF

■ **PSI and Sprint Batch Faxes** Modem maker PSI Integration and long-distance carrier Sprint have a deal that lets users of PSI's Faxcilitate software, which is bundled with PSI modems, send the text of a fax to Sprint for broadcast to many receiving fax machines. This avoids tying up the office fax machine or a fax modem to send the same document to a long list of recipients, and may save money for long-distance faxes. PSI, 408/559-8544; Sprint, 808/366-3297.

■ **Data-Analysis Tools Upgraded** Brio Technology has upgraded its cross-tab program, DataPivot, and its mainframe database query tool DataPrism. The \$299 DataPivot 1.5 adds Apple-events support for batch processing and integration with other software (including DataPrism), and can read Excel, Lotus 1-2-3, and dBase files in native format. The \$399 DataPrism 2.1 also adds Apple-events support, can access data via several new dialects of middleware, and provides the database administrator with more control over user access. 415/961-4110.

■ **MacWrite Pro Talks** MacWrite Pro version 1.5 will support PowerTalk to allow sending and receiving documents on a network using the E-mail features built into Apple's new System 7 Pro. Other features new in 1.5 include AppleScript support and a table of contents generator. MacWrite Pro was scheduled to ship in the fall of 1993 for \$249 from Claris. 408/727-8227.

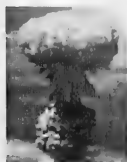
come with Nisus, as well as tables created with the table editor, a separate application that provides style sheets and templates. (Nisus Writer 4.0 won't fully implement AppleScript, but it already has a powerful macro language.)

The new version should ship in January, but pricing was not set at press time. Access to Nisus Writer's support for non-Roman character sets, including Chinese and Arabic, will require a hardware key and language-specific modules at extra cost, as well as Apple's WorldScript extension. Nisus Software, 619/481-1477.—D.L.

"I DON'T NEED (tick) YOUR DATA (tick) PROTECTION SOFTWARE (tick). I'VE HAD MY MAC (tick) FOR YEARS AND (tick) IT HASN'T CRASHED (tick) YET."

Not to alarm you or anything. But if a lot of wishful thinking is all that's standing between you and a Mac meltdown, you may want to check out a more proven method of protection.

We suggest the Norton Utilities for Macintosh v2.0. It both prevents data loss and gives you the most effective



Without us, one crash can ruin your whole day

data recovery features available. In other words, it's like giving your computer its own personal bomb squad.

For starters, let's talk prevention. The Norton Disk Doctor hunts down potential problems and lets you squash them before they become actual nightmares. Plus, Speed Disk defragments files and boosts performance of your hard disk, making data loss less likely in the first place. So far, so good.

Now, the recovery part. Our FileSaver feature keeps a record of vital disk information, which helps



From Peter Norton, the leader in Macintosh utilities.

you rescue files if you happen to lose or delete them. On top of that, you get automatic backup. It's total security like this which has helped Norton Utilities become the best-selling data protection and recovery software in the world.

To learn more, dial FAST FAX 1-800-554-4403 and select option 1, document 411. (For information on easy network installation, choose option 1, document 481.) Better yet, pick up Norton Utilities at your local dealer for about \$149.*

You should probably do it today, though. Before your luck runs out.

**THE NORTON
UTILITIES**
FOR MACINTOSH
SYMANTEC.

*Suggested retail price. Actual price may vary. All names are trademarks of their respective companies. For more information in Europe, call 31-71-353111. In Australia, call 612-879-6577. In Canada, call 1-800-465-2266. Everywhere else outside U.S., call 408-252-3570. ©1993 Symantec Corporation.

Working Smart

Planning the Perfect Presentation

YOUR TEETH CHATTER, YOUR HEART pounds, your palms sweat. You hear your name—time for the big presentation. Standing up, you hear chuckles and feel terror as you realize that you are in your underwear!

Whew—just a bad dream. The presentation isn't until next week, and it's been months since you forgot to dress for work. Besides, you plan to enlist help from a presentation program like Microsoft PowerPoint, Aldus Persuasion, or Gold Disk's Astound. A presentation program can help you organize your thoughts with its built-in outliner, and its layout features and libraries of templates and clip art make creating attractive visuals easy. The slide-show mode turns your Mac into a projector that can show your visuals with flashy effects.

Choosing a Medium

Before you start, you need to choose an output medium: Are you creating overhead transparencies? 35mm slides? Will you use the Mac as a projector? You can change the size of the visuals after you create them, but you may have to reposition some elements.

Several factors will influence your choice of an output medium.

- Do you want to encourage or discourage audience participation? A darkened room suggests a formal presentation and inhibits the audience from participating. Slides require a darkened room, while overhead transparencies can be shown in lit rooms. You can also write on overheads to annotate a point. For Mac-based presentations, the lighting conditions you need depend on how you're projecting the Mac's screen (see "Surveying Presentation Hardware"). A 35-inch monitor yields a vivid image that looks fine in a lit room; a video projector and movie screen require dimmed lights.

- What equipment will be available to you? If you'll have a Mac and a large-screen monitor, you might be inclined to use the Mac as your medium. Otherwise, slides or overheads are in order.

- Are you willing to live on the bleeding edge? Presentations shown with the Mac can have fancy visual effects, sound tracks, and QuickTime movies, but they often go awry because of system crashes, power glitches, kicked power cords, or Murphy's Law. This is especially true if you won't be using your own Mac: different fonts, system extensions, and available memory are common causes of presentation pickles.

Outlining an Approach

If you want your audience to swallow your ideas, you have to make your visuals di-

lines of text per overhead. Put no more than four or five lines on a slide or electronic visual. If a heading takes more than one line, you're probably trying to cram too much information onto a single visual. If a bulleted point takes two or more lines, break it into two or more separate points. Capitalize slide titles like book titles ("Next Quarter Goals"), and capitalize bulleted items like sentences ("Increase our market share").

For slides or electronic visuals, consider using builds, in which bulleted items appear one at a time on consecutive visuals, to present and discuss each bulleted

point separately. To create a build in Microsoft PowerPoint, display the appropriate slide, choose Build from the Slide menu, and check the Build Body Text box. To gray out the previous bullet when you advance to the next point, check the Dim Previous Points box. For electronic presentations, you can choose a build effect from the Effect pop-up. Fly From Right, for instance, slides each bulleted point into place from the right edge of the screen. Choose effects judiciously and use them sparingly.

To specify that Persuasion use builds for all visuals, switch to the Master slide, and select the placeholder for the bulleted

items. Choose Build Layers from the Master menu and specify the number of layers you want.

Design Decisions

All presentation packages include a large library of templates with a color scheme, type attributes, and graphic flourishes. If you're no designer, a template is the safest method to get good results. (My favorite



gestible. That means putting a manageable number of words and lines on each visual—a job you tackle during the outlining phase.

Generally, use a separate visual for each main idea. Then use bulleted points to elaborate on each idea (see "Building a Visual"). Don't be wordy—your visuals should be signposts, not eye charts. For overhead transparencies, use about seven words per line, and no more than seven

ite Persuasion template is \$50; I'm also partial to PowerPoint's BLUDIAG3. Both of these templates are shown in "Building a Visual.")

But you may want to create a design from scratch. For slides, use a dark background color and light-colored text. (White or yellow text on a blue back-

ground is popular and looks classy.) A bright background in a darkened room creates too much contrast and will give your audience headaches. PowerPoint and Persuasion also let you create a gradient fill, an effect in which one color gradually blends into another—an elegant look if you choose colors carefully. A fill that graduates from blue to black looks great on a big screen. (PowerPoint makes choosing colors a breeze; indeed, if you're shopping for a presentation program, consider PowerPoint first—it's a better program than Persuasion.)

For laser-printed overheads, use black text on a white background. If you have a color printer, consider using light-colored text on a dark background, but choose these colors carefully. Pure colors such as yellow and blue, which don't require dithering (patterns of dots), generally will give the best results.

Consider adding an element to the background on the master slide, whose contents appear on each visual. Your company logo or the title of a conference are typical candidates for a master slide. Be sure to position the repeating element so that the contents of each visual won't obscure it. To display the master slide in PowerPoint, choose Master Slide from

SURVEYING PRESENTATION HARDWARE

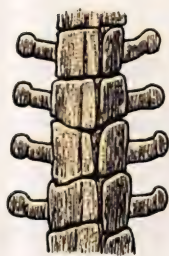
Here's an overview of the hardware you can use for a presentation.

- **Film recorder** With a film recorder—plus time and practice—you can make your own slides. GCC Technologies' \$5999 ColorFast II Film Recorder, a popular QuickDraw-based model, combines Polaroid-built hardware with GCC's first-rate driver software. If you create slides only occasionally, you're better off with a slide service bureau like Genigraphics or Autografix. PowerPoint has a driver for the former; Persuasion and Astound support the latter. These packages let you transmit slides to a service bureau via modem.

- **LCD projection pad** A projection pad connects to the Mac's monitor port and sits on top of an overhead projector, putting the Mac's image up on the big screen. In "Crystal-Clear Pre-

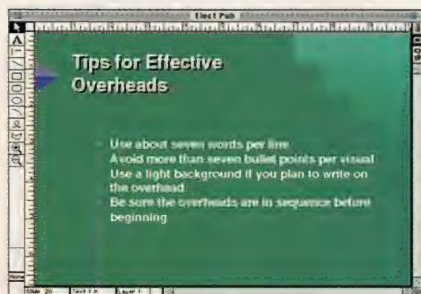
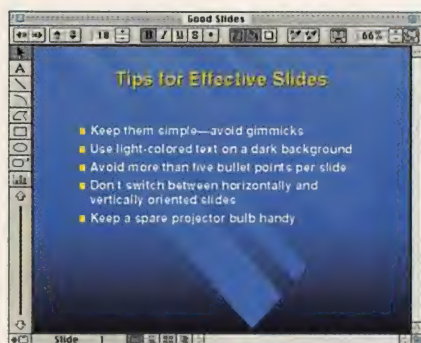
sentations," *Macworld*, January 1993, nView's MediaPro earned the Editors' Choice for its image quality. For this column, I worked with a Sayett Technology Mediashow XC Color LCD Projector, which contains a built-in projection unit—no separate overhead projector required—and I was impressed with its image quality and portability.

- **AV Mac** The Centris 660AV and Quadra 840AV can generate a standard NTSC video signal that you can save on videotape or display on a television set. Many corporations rely on 35-inch Mitsubishi video monitors for electronic presentations—for what one of those beasts costs, you can buy a Quadra 840AV and a 35-inch television set. And you can watch Nickelodeon—er, I mean the Financial News Network—when you aren't using the TV for presentations.



Spine

The s-shaped curve of your spine needs support when you sit at your computer or else the strain of poor



Building a Visual Both Microsoft PowerPoint (top) and Aldus Persuasion (bottom) include templates that provide attractive backgrounds and color schemes. Two of my favorites are shown in these slides, which also illustrate capitalization guidelines for slide titles and bullet points.

the View menu; in Persuasion, choose Current from the View menu's Slide Master submenu.

As for typefaces, I'm fond of Helvetica Bold—it's sturdy and stands up well under projection. Serif typefaces such as Baskerville, Caslon, and Century Schoolbook often look fuzzy. Avoid type sizes smaller than 18-point for transparencies.

Getting Glitzy

PowerPoint and Persuasion both let you import graphics and even QuickTime movies into a presentation. In Persuasion, use the File menu's Import command; in PowerPoint, use the Edit menu's Insert submenu.

What to import? A photo showing the new product or the new CEO, a scan of the annual report or the new package design, or a graph showing recent financial results. Be careful with QuickTime movies, though—the video can be fuzzy and the audio unintelligible.

Gold Disk's Astound has more glitz than an Oscar Awards ceremony. Besides supporting movies and digitized sounds, Astound invades animation territory with graphs that tumble into view or assemble themselves bar by bar. A Timeline window lets you orchestrate a cast of sounds,

movies, and visuals to play back automatically—ideal for self-running presentations. These features can be effective if used tastefully and sparingly—and therein lies the rub (or at least one rub; Astound's astounding appetite for disk space and memory is another). Using too many flashy effects is distracting and tacky. And of course, inviting sound and motion to the party increases the amount of disk space and memory your presentation will require as well as the odds that something will go wrong.

Another Astound feature enables you to create on-screen buttons that display other slides when clicked. With this feature, you can create interactive presentations that viewers can navigate on their own—it's interactive multimedia without the expense and learning curve of a program such as Macromedia Director. If you know the audience members have Macs, you can create an interactive version of a presentation and pass it out on floppy disks with a copy of Astound's player engine.


Looking for a Handout

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of your presentation enables viewers to take notes during your pitch and refresh their memories later. Hard copy also shows you're confident enough to commit your ideas to paper, and care enough about your audience to go to the trouble of doing so.

PowerPoint and Persuasion can automatically generate handouts based on the visuals you've created. (You can also print and pass out the presentation in outline form; that saves paper, but it isn't as attractive and doesn't leave much room for your audience to make notes.) Both programs can create two basic types of handouts: note pages, each containing a single visual with blank space below for doodles; and handout pages, which print several visuals on each page.

If you're using handout pages, avoid printing too many visuals on each one. You may save paper by printing six slides per page, but you leave little room for notes, and readers will have to squint to read the slides. Keep it down to three on a page. Don't forget to add a company logo and your presentation title to the handouts, and draw some lines on each page for audience notes.

After you've printed the handouts, staple or bind them to keep them in order. (Paper Direct, at 800/272-7377, has a great selection of presentation binders and other specialty papers.) Distribute handouts before your presentation begins. Nothing dilutes a presentation's impact more than audience members passing wads of paper to each other while you talk. Distribute pencils or pens too so audience members won't spend the first few min-

utes of your show looking for something to write with.

Showtime!

Before the big day arrives, visit the Room of Doom and case the joint. If there's a public-address system, adjust it so you don't deafen attendees with microphone feedback or spend the first few minutes asking, "Can you folks in the back hear me?" Make sure the screen is visible, and you won't stand between the screen and the audience by positioning the screen to your right or left, at an angle where the audience can see it. If you're using a slide or overhead projector, keep a spare bulb close by. Get everything running and do a dry run. Frantic last-minute preparations in front of a waiting audience make you look like an amateur.

I may be wading into hot-tub psychology here, but I believe it really helps to visualize yourself giving the presentation. Imagine being introduced, then making your remarks and fielding questions with confidence. Speaking of questions, if you don't want to take any until the end, be sure to say that either at the outset or when the first hand goes up. If you want an informal, give-and-take exchange, say that—although you risk letting the event go in its own direction.

If you plan to use props during your presentation, keep them covered or hidden until needed, and put them away when you're finished with them so they don't distract the audience. During the presentation, look at and talk to the audience, not the screen. Make eye contact with your audience—a second or two per victim. Don't keep your hands in your pockets or folded on a lectern, but use natural hand gestures for emphasis. If you're taking questions at the end, be sure the entire audience hears each question—repeat it if necessary, or station a microphone in an aisle. If there's a question you can't answer, be honest: say you don't know but you'll find out. Don't try to fudge an answer—someone in the audience may know you're doing so.

The keys to a successful presentation are preparation and practice. The more often you speak before a group, the more natural it becomes. Organize your thoughts, create simple, tasteful visuals, and make sure that the room and everything in it are ready. And don't forget to wear your slacks. **m**

Next Month: Graphs and Charts

WHERE TO BUY

Aldus Persuasion 2.12

\$495; Aldus Corporation; 206/628-2320.

Astound 1.0

\$399; Gold Disk; 310/320-5080, 800/465-3375.

ColorFast II Film Recorder

\$5999; GCC Technologies; 617/275-5800, 800/422-7777.

MediaPro

\$8595; nView Corporation; 804/873-1354, 800/736-8439.

Microsoft PowerPoint 3.0

\$495; Microsoft Corporation; 206/882-8080, 800/426-9400.

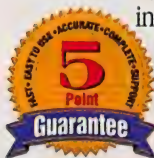
Sayett Mediashow XC Color LCD Projector

\$8595; Sayett Technology; 716/264-9250, 800/678-7469.

Contributing editor JIM HEID has been writing about the Mac since its introduction. His most recent book, *Macworld Complete Mac Handbook + CD*, is published by IDG Books Worldwide.

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right multiuser
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Databases

That Work

In the Mac's wonderful world of sound, color, and QuickTime movies, we sometimes forget that databases, not multimedia presentations, are the fundamental reason for using computers in business. In the millennia before modern business evolved, some sort of database—the Sumerians used clay tokens, the Incas used knotted strings—usually preceded the development of actual writing; in other words, databases using little physical objects mark the beginnings of economic life. People just insist on keeping track of stuff, from llamas to baseball cards to mutual-fund holdings.

A modern-day business must keep track not only of what it owns, but also of how its assets are tied to other aspects of the business. For example, your inventory database should be connected to your customer database—that's how you know which customers owe you money for products they've bought from you. Though a flat-file database manager such as Claris's FileMaker Pro 2.0 can be

browbeaten into looking up information in other files, relational database managers are designed from the ground up for exactly that kind of task.

The relational databases used for most important business tasks are basically programming languages with special preprogrammed features for storing data in tables, executing search queries, and other data-management functions. When developers or in-house information-systems managers evaluate databases, they typically need to consider four factors:

- Does the database programming language have the right feature set? Some databases, for example, support online transaction processing (OLTP), a technique for managing incomplete transactions that is most commonly used in reservation systems and point-of-purchase applications. Not all applications demand OLTP capability.

- How fast is the database? Slower databases may be acceptable for small groups, but they may not be satisfactory for large networks.

- How easy is it to program something useful and how long will it take to complete a project? For some situations,

by **Charles Seiter**



mented an Omnis system for the Harvard Business School that supports 220 concurrent users. Doyle has done tasks of similar scope for Raytheon and ARCO. In his view, only Omnis has the right language features to accommodate large numbers of concurrent users. For example, as users enter data, the Harvard program updates the database automatically on an optimal schedule, and it divides client-based and server-based tasks so that users get nearly the same response as if data were stored locally. Another attraction of the Omnis language is that applications for Windows and the Mac can use identical, not just similar, code—in a properly designed Omnis 7 program, porting across platforms is automatic.

Dewey Gaedcke of Complete Data Solutions, in Austin, Texas, points out that, besides offering Windows-to-Mac connectivity, Omnis's language is designed so that applications can be programmed by selecting keywords from a series of menus and filling in parameters, similar to pasting functions into Excel cells (see "Drag-and-Drop Omnis Programming"). Because the keywords are the same on the Mac, Windows, and Unix, connectivity to Sybase, Oracle, DB2, and other SQL databases is particularly easy. The Omnis language also offers commit/rollback commands, which make it possible to back out of a half-completed transaction, so developers frequently pick it for online transaction processing jobs.

Omnis 7 version 2 includes a version-control system, somewhat similar to Apple's SourceServer in MPW, that lets an administrator manage a team of programmers and track the pieces of code libraries and database objects they create. Omnis 7 version 2 not only lets developers customize the development environment, but also its meta-tool capability lets developers include a certain amount of the development environment's features in an application, so that end users can customize an application's fonts, colors, and other features.

Blyth's current business emphasis is on supporting developers on large projects. The development kit costs \$3750, and the fee for each user of an Omnis-based application is approximately \$300. This means Blyth customer support won't be pestered by anyone developing a Christmas-card mailing list, but the cost is no deterrent for developers who implement \$50,000 projects.

FoxBase+/Mac

When *Macworld* last reviewed FoxBase, Fox Software was an independent company and FoxPro, a major upgrade to FoxBase, was still in the rumor stage. Since then Microsoft has acquired Fox, and FoxPro for Windows is up to version 2.5—but Mac developers are still waiting on FoxPro for the Mac.

The programming structure and interface features of FoxBase+/Mac were originally fairly primitive by Macintosh standards. The simple procedural programming language (see "FoxBase Procedures") and austere interface contributed mightily to Fox's speed advantage over any available Mac database,

In Transit Dewey Gaedcke (right) of Austin, Texas-based Complete Data Solutions at a pipeline site near Pasadena, Texas, with J. Alec Mize, CFO of Michael Curran Pipeline Contractors. Gaedcke developed a personnel database in Omnis for Curran, whose employees often work in several tax jurisdictions in the same week.

getting a database up and running quickly may outweigh the need for intricate programming features.

- How does the database fit in with the outside world? Since approximately half the Macs used in business are on mixed-platform networks, developers need to evaluate how well a database can connect to databases on other platforms and whether a database developed on the Mac can be converted for use on another platform with little extra effort.

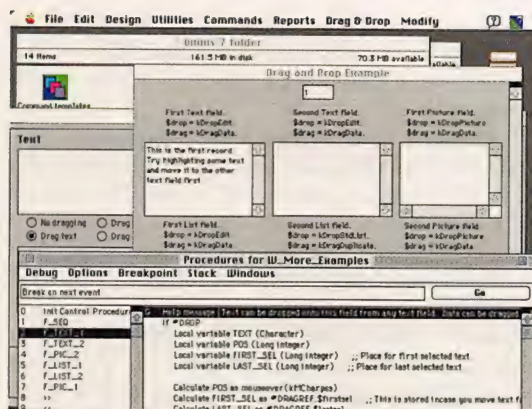
We interviewed 36 developers, consultants, and information managers to get a reasonable statistical cross-section of experiences with five multiuser relational database management systems: Blyth Software's Omnis 7 version 2; Helix Technologies' Helix Express 1.0; ACI US's 4th Dimension 3.0 (and 4D Server 1.0.1); Microsoft's FoxBase+/Mac 2.01; and newcomer EveryWare Development's Butler 1.2.5. Twenty of the experts we interviewed develop applications in at least two database managers, and seven of the experts have long histories in three or more of them. We found an impressive level of agreement among developers on the strengths and weaknesses of all the relational database products.

Except for Butler, these products have been around for years (Helix Express is a new name for the revised Double Helix), steadily gaining features and usability, and Butler was designed for the demands of client-server situations. All of these products can handle a wide variety of data types and have a rich set of programming capabilities. The products differ significantly in the kind of business applications each is appropriate for.

Omnis 7

Despite Blyth Software's low profile in the Mac market, its Omnis 7 version 2 is popular among developers with large network projects. This big-project bias arises for several reasons. First, Omnis code developed on the Mac can run unmodified on Windows-based PCs, and most large networks accommodate both platforms. Second, Omnis has commands that allow a database application to monitor network traffic in client-server applications, managing the details of requests and responses to prevent network log-jams.

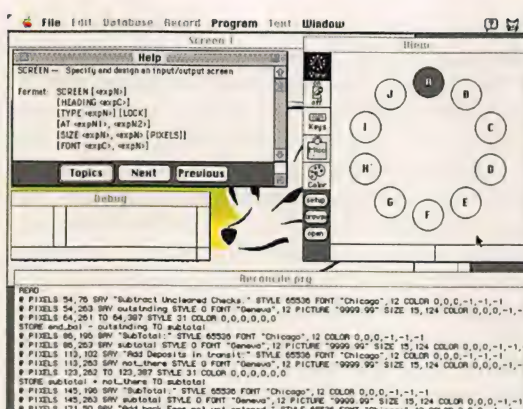
Kevin Doyle, of Kevin J. Doyle Computer Systems Consulting in Andover, Massachusetts, imple-



Drag-and-Drop Omnis Programming With the radio button Drag Text selected, the procedure creating the fields in this Omnis application makes it possible to drag text between fields. The bottom window shows Omnis's sophisticated debugging facilities.

since rich graphical features in practice tend to hamper raw database performance. Also, since FoxBase was originally designed as a DOS database, porting a Mac project in FoxBase back to nongraphical platforms was straightforward.

These historical considerations have influenced the developer community. We didn't encounter any Mac-only FoxBase developers—FoxBase has a long learning curve and it wouldn't make economic sense to ignore the Windows market once you learn FoxBase on the Mac. For Robin Wolfson and Jesus Estrada of California's Department of Education, however, FoxBase is nearly the only possible choice. Wolfson and Estrada develop software for child-care agencies that use DOS PCs, Windows PCs, Macs, and Unix systems, and FoxBase is the only product covering all of these four platforms. The state is taking a conservative view because it wants a vendor that it's sure will be around to provide support in five or ten years.



FoxBase Procedures Fox database programs usually consist of large collections of program text files like the one in the lower window here. Fortunately, much of the code can be generated by making selections from dialog boxes rather than by writing code.

In contrast, Mohsen Moazami of Stanford Business Systems in Culver City, California, has used FoxBase+/Mac for several large projects in recent years, principally because of FoxBase's crucial speed advantage. But Moazami is now developing Macintosh client-server projects in 4th Dimension, putting cross-platform work in FoxBase on hold until the Mac version of FoxPro arrives. Other developers are continuing FoxBase+/Mac work in the interim, especially if they have customers whose networks include DOS machines. Although the interface facilities aren't as magnificent as those in databases designed for the Mac, the FoxForm and FoxReport screen-builders handle routine graphics chores and are compatible across platforms.

4th Dimension and 4D Server

ACI US's 4th Dimension has long been the most popular Macintosh relational database. 4D was the first database to take advantage of the Mac's graphi-

How Relational Databases Find Information

A relational database program finds records that meet criteria in several tables by performing a series of Boolean operations to find where the contents of the tables overlap. In this example, the program searches for past-due invoices owed by commercial customers.

1) Customer Type in Customer Table EQUALS Commercial

This step selects all commercial customers and makes a list of them with their ID numbers.

CUSTOMER TABLE		
Customer	Type	ID No.
CIA	Govt.	250
Consolidated	Com.	755
FreezeAll Co.	Com.	705
EPA	Govt.	210
PressEx, Inc.	Com.	725
Justice Dept.	Govt.	260
Toy King	Com.	745
U.S. Army	Govt.	230

2) AND Invoice Age in Invoice Table IS MORE THAN 90 days

This step selects all past-due invoices and makes a list of them with their ID numbers and amounts.

INVOICE TABLE		
ID No.	Invoice Age	Amount
250	30	\$1250
250	180	\$1160
755	120	\$2550
755	60	\$5300
705	120	\$2950
705	180	\$1370
210	120	\$4250
210	30	\$3250

3) AND ID Number in Invoice Table EQUALS ID Number in Customer Table

This step finds where the list of commercial accounts and the list of past-due invoices intersect.

Commercial Accounts		Past Due	
Consolidated	755	250	\$1160
FreezeAll Co.	705	755	\$2550
PressEx, Inc.	725	705	\$2950
Toy King	745	705	\$1370
		210	\$4250

Producing a Report

Data retrieved from the database can be merged into a form letter.

12/18/93

Accounts Payable
Consolidated, Inc.

Dear Sirs,

It has come to our attention that your invoice in the amount of \$2550 is past due. Please . . .

cal interface, and it provided a sophisticated, Pascal-like programming language (see "Linking Two 4D Tables"). External code is easily integrated with 4D applications (ACI US even markets a word processor, a spreadsheet, and several other applications, written in lower-level languages, that can be woven into a 4D database). After several years of small upgrades, version 3.0 and the new 4D Server have been welcomed by the developer community. 4D's multitasking capability, which allows different tasks to be performed as background activities, lets developers organize routine database chores in ways that work around some of the speed deficiencies of the 4D database engine. The basic search engine, some developers complain, wasn't dramatically improved in this release, though 4D Server can divide tasks between client and server to boost performance for client users. Developers also criticize 4D's inability to open more than one database at a time.

We didn't encounter developers who have implemented large networks with more than 40 users on 4D Server, perhaps because the product is relatively new and developers (and their customers) tend to be cautious about entrusting priceless data to untried products. But developers in many cases use 4D Server as the main link to a larger Sybase or Oracle database, with 4D Server on a Quadra or Centris distributing data to 10 or 15 smaller client Macs.

This two-step front-end approach means that the network never has to wait for a long data stream to be downloaded directly from a VAX to an SE, for example.

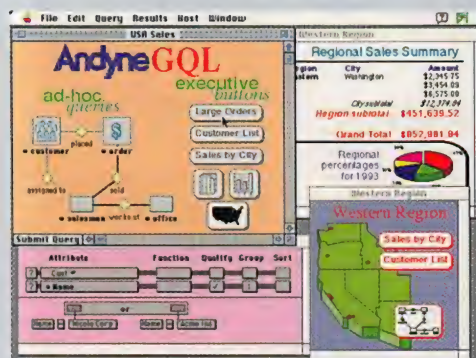
Communication between 4D databases and central Oracle databases can now be managed with ACI US's 4D Oracle, a connectivity product that consists of a package of 4D externals that exchange data between 4D and Oracle databases over SQL-Net (Oracle's proprietary networking software). At the 4D end, users can click and drag objects to build a query, which 4D Oracle processes into procedural code. For connection to Sybase, ACI US offers 4D SQL Server, which has graphical query building; and for other databases, ACI US offers 4D DAL (Apple's Data Access Language, a custom version of SQL). All three connectivity products are \$395 per user.

Most developers seem to be following this pattern: 4D is used for a local or workgroup database, with enterprise-wide chores assigned to SQL databases on larger computers. Some developers, however, are sticking with 4D as the host. For example, Randy Shepherd of Network Equipment Technologies in Redwood City, California, has used 4D Server extensively, and says he sees smaller workgroups as key users of 4D client/server software. Instead of a single enterprise-wide network for hundreds of concurrent users, businesses are requesting cus-

HOW TO TAP THE CORPORATE DATABASE

Large businesses already have corporate databases, of course, so the question isn't "How do we set up a 4D or FoxBase+/Mac database?" but "How do we use Mac tools to get the data to the people who need it?" Omnis and 4D are frequently used as front ends to large databases (ACI US released 4D Oracle in June 1993 specifically for this purpose), but they face stiff competition from other Mac products.

One major contender at large corporations is Andyne Computing's GQL (613/548-4355), a tool for generating SQL queries that shields users from the chore of learning SQL syntax. In a GQL screen, the user sees a graphical representation of the database structure in Oracle, Sybase, Informix, Ingres, IBM's DB2, or 11 other minicomputer or mainframe databases (see "Database Access with GQL"). By clicking on buttons and selecting icons, the user can generate an SQL query to download data from the database to spreadsheet-style forms or to Lotus 1-2-3 or Microsoft Excel worksheets. GQL/Admin provides tools that let a system administrator customize the query possibilities, simplifying the user's task and building in security features as well. Greg Haynie of Martin-Marietta, for example, has set up a GQL system for financial queries from a Sybase database, providing 50 users with access tools they can easily customize on their own. Haynie reports that GQL is amazingly fast if the underlying data model (the set of tables on the host computer and the links between them) is designed well. GQL is \$495 per user, and GQL/Admin is \$1995.



Database Access with GQL An administrator can set up GQL as an executive information system. In the top left window, the Ad-Hoc Queries object shows the structure of the underlying database, and Executive Buttons contain pre-defined queries.

DataPrism from Brio Technology (415/961-4110) also offers point-and-click access to host SQL databases, with additional control by the user over table presentation and joins of table selections. The difference between GQL and the \$399 DataPrism is that DataPrism is really designed as an end-user product, with a modest but adequate set of data-access constructs, whereas GQL is best for developers who, underneath the graphical interface, have access to a full programming language for both query and interface construction. In the DataPrism approach, when you log on to a host SQL database, you see dialog boxes for the names of database tables and then for columns in those tables; you need this information to construct your own tables for reports or to generate queries in the host tables. In GQL, an administrator would normally have set this up for you already. DataPrism also offers a window for entering text SQL commands when all else fails, but text-based queries are not the point of the product. Brio's companion product, the \$299 DataPivot, takes data tables downloaded into DataPrism and lets you perform cross-tab analysis of the data; this is one of the most useful examples in the database industry of a company coordinating its products.

tomized databases for much smaller groups that require less hardware outlay and administrative overhead. For productivity-conscious small-group applications, 4D developers can create self-explanatory database and query systems that require minimal employee training—4D's user-interface tools, conceded to be the best in the business, make this possible.

Helix Express

Helix is a unique Mac-only database. It was one of the first useful examples of visual programming; and Helix applications are programmed by arranging icons that perform database tasks rather than by writing procedures (see "Visual Programming in Helix"). Helix's icon-based "code" is easy to modify by rearranging the icons, but this orientation has meant that cross-platform versions were not even rumored until Windows appeared (and they're still just rumors). Helix has always been intrinsically multiuser, and Helix Express now incorporates several special features for document management that the previous publisher, Odesta, originally made available as separate products that ran on a Mac-and-minicomputer combination.

Helix underwent a midlife crisis a few years ago, in which its early strong position was eclipsed by newer and faster products. But the trend toward workgroup computing that's been reported by 4D developers has helped Helix as well. In workgroup situations, Helix's flexibility gives it an important advantage—users can modify a Helix application simply by taking instructions over the telephone—and its slower overall performance is less critical on small networks of six to ten users.

Helix Express incorporates the BLOB (Binary Large Object) technology from Odesta's document-management system, so Helix can store documents, images, and other nontraditional data types inside standard database records. Gil Numeroff of Synergy Marketing Communications in Syosset, New York, has been exploiting BLOB features for specialized publishing databases and help-desk systems. Raw search and sort speed in these applications isn't as important as efficient storage and transmission of



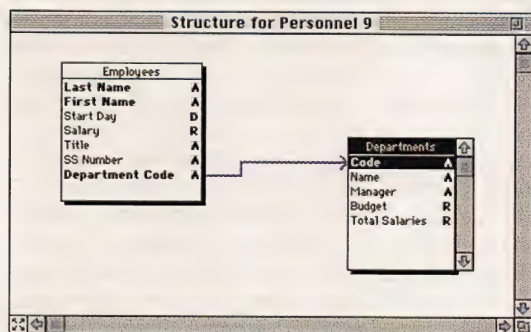
the large files that are the objects of a search, so Helix Express actually outperforms other Mac databases for this work.

Applications in Helix can be quickly developed and then refined to meet changing client requests after delivery—developers report that quick postdelivery modification is Helix's greatest commercial advantage. Although BLOB-based applications tend to raise Helix's profile in the document-management market niche, Helix is still being used for mainstream commercial applications as well (for example, see the review of the Helix-based sales-automation program Market Master Manager 3.5 in *Macworld*, October 1993).

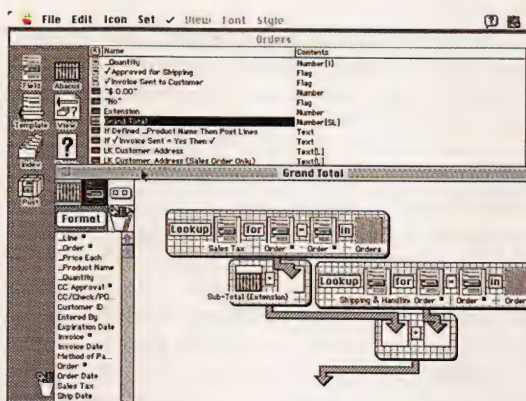
Butler

A unique client-server product called Butler, from EveryWare Development, represents a departure from standard Mac relational databases. It's a server with no front end of its own, designed to use GQL, DataPrism (see "How to Tap the Corporate Database"), and a host of everyday Mac applications (Excel, Resolve, and HyperCard, among others) as the data-delivery vehicle at the user end. Users access the Butler server through a DAL interpreter, and the Butler software package provides tools for creat-

Heavy Industry Gil Numeroff (left) of Synergy Marketing Communications, Syosset, New York, with his client Arnold Eisenberg of East Side Glass in Manhattan. East Side supplies windows for the World Trade Center and other commercial sites.



Linking Two 4D Tables A 4th Dimension programmer would link the Employees table to the Departments table by simply dragging an arrow across. Easy graphical specification of database structure is one of 4D's strengths, but developers reserve their highest praise for 4D's rich interface-building tools.



Visual Programming in Helix Calculations in Helix are created by dropping icons that represent data fields into holes in a tile, which is then connected to other tiles. Each tile has a small, specific data-handling function. Helix developers can rapidly modify programs by rearranging tiles in this all-graphical environment.

Relational Databases at a Glance

	ACI US	Blyth Software	EveryWare Development	Helix Technologies	Microsoft
General					
Product	4th Dimension 3.0	Omnis 7 version 2	Butler 1.2.5	Helix Express 1.0	FoxBase+/Mac 2.01
Phone	408/252-4444	415/571-0222	905/819-1173	708/465-0242	206/882-8080
Toll-free phone	○	800/346-6647	○	800/364-4359	800/426-9400
List price	\$895 ¹	\$3750 ²	\$395 or \$1695 ³	\$439	\$495
Field Types					
Character	●	●	●	●	●
Short integer	●	●	●	○	○
Long integer	●	●	●	○	○
Floating point	●	●	●	●	●
Boolean	●	●	●	●	●
Picture	●	●	●	●	●
List	○	●	○	○	○
Binary	○	●	●	●	○
Interface					
User-definable menus	●	●	●	●	●
Pop-up menus	●	●	●	●	●
Cut and paste to reports	●	●	●	●	●
Split window panes	●	●	●	○	○
Programming					
Application generator	●	●	●	○	●
Report generator	●	●	●	●	●
Run-time version	●	●	●	●	●
Other Features					
Commit/rollback support	○	●	●	○	○
Versions available (DOS/Windows/Unix)	○/○/○	○/●/●	○/○/○	○/○/○	●/●/●
SQL commands	●	●	●	○	○
Import and export (delimited ASCII/.DBF)	●/○	●/●	●/●	●/○	●/●

● = yes; ○ = no. ¹ 4D Server ranges from \$1495 for 3 users to \$21,495 for 100 users. ² Run-time version starts at \$300 per user. ³ Personal Butler is \$395, Network Butler is \$1695 for unlimited users. ⁴ Front-end application determines interface. ⁵ Separate option.

ing databases, importing data from existing files, and setting access privileges. Butler users comment on two notable strengths of the system: careful control over security, and robust commit/rollback commands for transactional data integrity.

Butler also uses some proprietary DAL tricks to keep query messages short, minimizing network slowdown when many users are accessing the database. The front end passes the requests to the Butler server as short text commands. The Butler engine processes each request, arranges a data packet containing only the requested information, and sends the result back to the client using one of Butler's tools for ISDN, ADSP, and modem support. The Butler product consists essentially of these communications tools and the tools used for linking the Butler engine to front-end programs (which also provide control of security and access privileges) for processing the DAL requests. Butler comes in two versions: Personal Butler, for single-server workgroups, and Network Butler, for remote and wide-area situations. Butler can run on a Macintosh server with as little as 2MB of free RAM—and can even support 4D and Omnis as client front ends.

The Database Choice

Database software is an area in transition, and the stakes are high. Your company's data is worth more than all its investments in computers and software, so the need for security, data integrity, and vendor stability will probably outweigh smaller interface or language advantages when you decide which platform to stake your claim on. Among developers, consensus on the right tool for the job is considerable. Big companies or organizations with databases of the Oracle/Sybase/Ingres class typically look to 4D or special SQL tools for Mac access. If the job dictates equality among Macs and Windows machines, Omnis figures prominently, as does FoxBase+/Mac if the hardware base also includes DOS PCs. Finally, 4D and Helix are establishing themselves as small-database workgroup favorites where end-user ease-of-use is critical. But be prepared to see these clear lines get tangled as relentless competition in the most important software category continues. ■

CHARLES SEITER is a *Macworld* contributing editor and has a long history of reviewing relational database products for *Macworld*.

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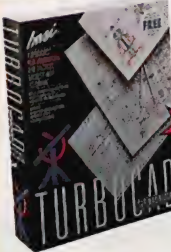
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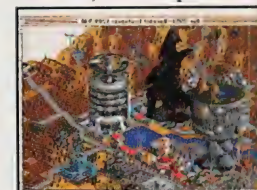
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Quick Tips

Tips, Tricks, and Shortcuts

"DON'T TAKE A BUTTON AND SEW A VEST on it," Perry Mason always warned whenever someone tried to build a case on one piece of evidence. In September's *Quick Tips* I recommended more than doubling the standard memory size of QuarkXPress (from 1700K to 3500K) before working with large color photos, making Trevor Barrett of Miami, Florida, wonder if he should double the memory sizes of all applications—and go buy all the RAM he can afford and then some. If only there were a simple rule for setting memory sizes of all applications! Instead, you determine an application's size by trial and error or by experience with that application. For instance, I arrived at my 3500K recommendation empirically—increasing QuarkXPress's minimum memory size a bit, opening XPress, trying to import sample color photos of different sizes, getting low-memory alerts, quitting, and repeating this procedure with a larger memory size until I stopped getting low-memory alerts. *Macworld* assistant managing editor Luis Camus, who uses QuarkXPress regularly, suggests a somewhat lower size of 3000K.

Clock Confusion

Q. I am considering an accelerator for my Mac IIsi, but I am confused when comparing 68030 and 68040 processors at various clock speeds. For example, is a 68040 at 20MHz slower than a 68030 at 25MHz?

Steve Sinclair
De Pere, Wisconsin

A. A Centris 610 with a 20MHz 68040 leaves a IIsi with a 25MHz 68030 in the dust and even beats a IIfx with a 40MHz 68030. An 040 gets by with fewer clock cycles per second primarily because it can work on six instructions simultaneously, whereas an 030 is limited to three. As a result, an 040 zips through instructions at an average rate of 1.25 clock

cycles each, compared with an 030's 5 clock cycles per instruction. To keep the instructions and data flowing, an 040 chip's high-speed instruction and data caches are eight times larger than those of an 030 chip. Moreover, the 68040's built-in math coprocessor outperforms the 68030/68882 combination in the IIfx and IIsi. Check out *Macworld* Lab tests of several 030- and 040-based accelerators in "Getting More from a Mac II" (June 1993), and watch for an upcoming article on a cheapo acceleration method called CPU boosting.



Two-Faced Printing

Q. For more efficient paper use I'd like to do double-sided printing using the sheet feeder on my StyleWriter II. Is there a program that would let me do this from any application?

David Clayton
Saint Albert, Alberta, Canada

A. A number of applications let you print just the odd-numbered pages, flip or rotate them, and print the even-numbered pages on the backs of the odd-numbered pages. These include Mac-

Write II, MacWrite Pro, Microsoft Word (5.1), PageMaker (4.0 and later), Personal Press, QuarkXPress (2.12 and later), WriteNow, and WordPerfect.

But you want a solution that works with all applications, and here it is (well, almost). DynoPage 2.0 from Portfolio Software (408/252-0420, 800/729-3966) grabs pages on their way from most applications to most popular printers and resequences the pages for double-sided printing. You take a stack of papers whose front sides have been printed, drop them in the paper tray, and click a button to print on their backs. DynoPage 2.0 can arrange double-sided printing in combination with other paper-saving techniques such as printing a reduced page on each side of the paper, booklet fashion. You control these printing tricks and a bagful of others from dialog boxes that appear automatically after the standard Page Setup and Print dialog boxes. What's more, DynoPage 2.0 comes with Printchooser, a handy utility for switching printers without the cumbersome Chooser.

If you had a PostScript printer instead of a StyleWriter II, you might care that DynoPage doesn't print PostScript graphics, such as those placed in a PageMaker publication, a problem noted in *Macworld*'s downbeat review of the product (July 1993). The PostScript graphic either doesn't print at all, or a PICT version of it prints (often a low-resolution screen version). Also, a few applications, printers, and fax modems are incompatible with DynoPage. To find out if any of yours are among them, just try out the free demo version available from online information services and directly from Portfolio Software.

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Love the Speed, Hate the Crashes

Q. I just purchased a Centris 610 after having an SE for several years. The difference is staggering! But I experience random cursor freezing, and I'm getting plenty of system errors and applications unexpectedly quitting (error types 1, 2, 3, and 8). Would Norton Utilities help detect the trouble? My version is not compatible with System 7.

*Chuck Potter
San Pedro, California*

A. When you bought a new Mac to replace an old one, you upgraded from System 6 to System 7 without giving the upgrade much thought. *Aoogah! Aoogah!* Better run Compatibility Checker 2.0 (supplied with System 7) right away to identify system extensions (INITs in System 6), control panels (a.k.a. cdevs), applications, and other items that need upgrading for use with System 7. Note, however, that Compatibility Checker completely ignores desk accessories, probably because there's no way to positively identify old ones. Moreover, it does not check the driver software on your hard drive. Ask the drive manufacturer for a compatible driver and installation instructions, or get hard drive software such as Casa Blanca Works' Drive7 or FWB's Hard Disk Toolkit from a software merchant. Because your Centris, like all new Macs, requires System 7.1, you must upgrade incompatible software. Naturally these upgrades aren't all free, and most of them require more disk space and RAM, not to mention your time in installing them.

Mac and Windows, Pards

Q. I have a Quadra, and my partner uses Lotus 1-2-3 for Windows on a PC clone. We need to exchange spreadsheet information. I am willing to buy 1-2-3 for the Mac, but what software will allow me to read his files?

*Ron Pitt
Louisville, Kentucky*

A. Popular Mac applications and their Windows or DOS counterparts can directly open and save files in the opposite platform's format. They include Lotus 1-2-3; WordPerfect; Microsoft Word, Excel, and PowerPoint; Aldus PageMaker and Persuasion; QuarkXPress; Ventura Publisher; and Adobe Illustrator. Also, Lotus 1-2-3 and Microsoft Excel can translate each others' documents with some limitations.

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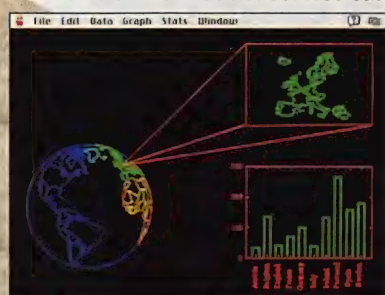
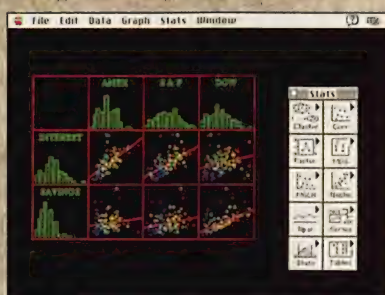
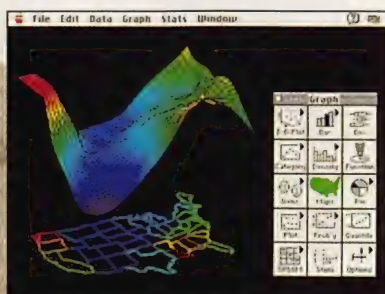
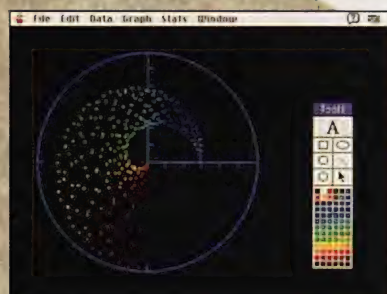
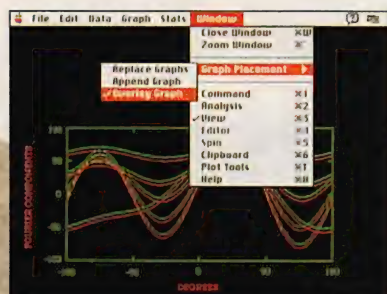
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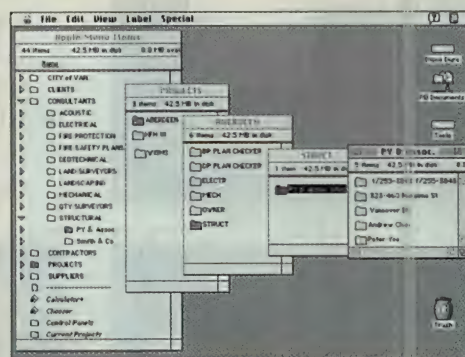
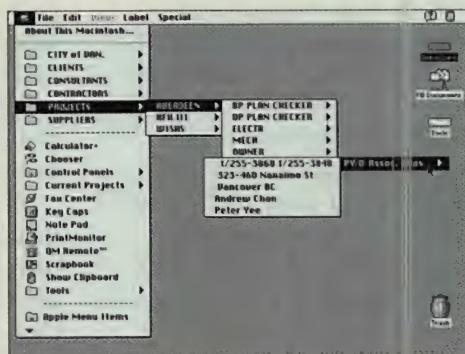
Here's an easy way to turn your Apple menu into a contact database. All you need is a utility that gives the Apple menu hierarchical submenus, such as Kiwi Power Menus, a System 7 extension from Kiwi Software (805/685-4031). By treating folder names as single-line entries in a database, Eric Rojo of Vancouver, British Columbia, has discovered that you can easily create an elegant hierarchical database of often-used addresses, phone numbers, client contacts, or other information you are tired of fumbling for on your crowded desktop. You access the data instantly from the Apple menu and its submenus, and view the data by traversing the menu structure without actually choosing any menu item (top). (When you're done viewing, just drag the pointer away from the menus and release the mouse.) For a persistent display, just choose the menu item whose submenu contains the data you want to see, and the Finder opens the folder containing the data (bottom).

Adding, deleting, and modifying data is a snap. First choose the menu item whose submenu you want to change, opening the folder in which you need to make changes. Then to add a line of data, use the Finder's New Folder command and type the data as the new folder's name. To add a submenu, open a folder and add folders to it. Remove lines of data by dragging corresponding folders to the Trash, and change data by editing folder names. Because items appear alphabetically by name in the submenus, you may have to put extra spaces or other special characters, such as asterisks, at the beginning of folder names to arrange the names in the order you want. For example, you usually have to do this with a multiple-line address.

Here's another neat trick: use aliases to duplicate data you want to appear in several places in the database. After making an alias of the folder you want to clone, simply drag the alias to the folder that represents another location in the database where you want the information to appear. Cloned parts of your hierarchical database stay up-to-date because aliases don't contain any duplicate data to get out of sync; the aliases just point at the folders that contain the actual data.

No matter how large your database of folders becomes, the Finder always calculates its size on disk as zero K! Yes, this is too good to be true. In fact, your data, consisting only of nested named folders, is kept in the start-up disk's invisible catalog file, which contains information about the hierarchical organization of files and folders on that disk. The Finder only reports the sizes of aliases and other actual files that you may have in your hierarchical folders.

Keeping contact information in a hierarchical Apple menu has two advantages over contact database software such as TouchBase or InTouch. One, your contacts are always available without opening (or keeping open) another program. Two, you can quickly find any contact without typing or even remembering a name. Managing hundreds of contacts is easier with contact database software, though.



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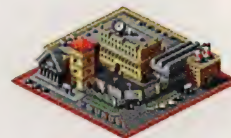
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Circle 40 on reader service card

utility software to see DOS files as icons and DOS directories as folders on your desktop. There are three possibilities: AccessPC 3.0 from Insignia Solutions (415/694-7600), DOS Mounter Plus from Dayna Communications (801/269-7200, 800/531-0600), and Macintosh PC Exchange from Apple (408/996-1010). If you insert a DOS floppy without one of these utilities installed, an alert says it's not a Mac disk and asks if you want to initialize it. (You do not.) AccessPC and DOS Mounter Plus also work with DOS-formatted SCSI-based removable media such as optical, floptical, Bernoulli, and SyQuest drives. DOS Mounter Plus even lets you access a Novell NetWare file server from your Mac. Your partner needs a utility, such as Insignia's MacDisk for the PC, to open and save your files on 1.4MB Mac floppies.

AccessPC 3.0 uses Easy Open, Apple's new file-translation extension for System 7, and includes some file translators for popular word processing, spreadsheet, and database applications. The granddaddy of file translation, MacLinkPlus/Easy Open from DataViz (203/268-0030, 800/733-0030) comes with Easy Open and 1000 translation combinations for word processing, spreadsheet, database, page lay-

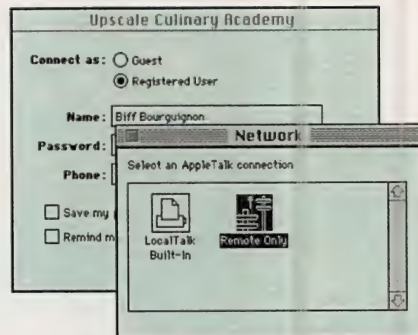
out, and graphics file formats; with MacLinkPlus/Translators Pro you get Macintosh PC Exchange.

Local and Remote

Q. While connected to my office computer from home using AppleTalk Remote Access (ARA), I cannot print on my ImageWriter II at home. I must log off the office computer, make AppleTalk inactive, select the ImageWriter, and select the printer port. When I finish printing I must reactivate AppleTalk (which disconnects the ImageWriter) and restart my home Mac before I can reconnect to the office. Is there any way around this cumbersome procedure?

Dean Coclin
via America Online

A. Open the Network control panel and select the Remote Only icon (see "Hard-Copy Connection"). This frees the printer port for non-AppleTalk uses, such as printing on an ImageWriter, StyleWriter, or LaserWriter LS. If you change the control panel setting while you are connected to a remote network, you will be disconnected. The Network control panel setting persists through restarts, so you only have to select it once unless



Hard-Copy Connection In the Network control panel, select Remote Only to use AppleTalk Remote Access at the same time as a non-networked printer connected to the printer port. If LocalTalk Built-In is selected, only a networked device can be connected to the printer port.

you later need to connect your home Mac to a local AppleTalk network.

When the LocalTalk Built-In icon is selected in the Network control panel, the printer port is configured for an AppleTalk connection. Turning off AppleTalk (in the Chooser) frees the printer port for non-AppleTalk uses but also disables AppleTalk Remote Access (ARA), which you need for connecting via modem to your office Mac from home.

continues

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Circle 3 on reader service card

In the dog-eat-dog world of business presentations, we just made you a pit bull with the legs of a greyhound.

In dog racing as in business, if you're not leading the pack, the view seldom changes. Meet your new leg up on the competition: the Tektronix Phaser™ 200 color printer. It's lean, mean, and very very fast. Of course, you don't have to take our word for it, *PC Computing* magazine just called it the best overall presentation printer in the business. So much for the other guys.

But what is it that makes the Phaser 200 so good? For starters, the ink coverage and image quality are, in a word, brilliant. We at Tektronix didn't get to be the award-winning leader in color printers by sitting on our hands. Then there's speed. You get all of this great color at two pages per minute, which is nearly as fast as a regular black and white printer. Can you say increased productivity?



On top of all this, the Phaser 200 is a work group printer that gives you the advantages of a laser printer. Including true Adobe® PostScript™ Level 2, networkability, separate paper and transparency trays and price (did we happen to mention the Phaser 200 has a list price of only \$3,695?).

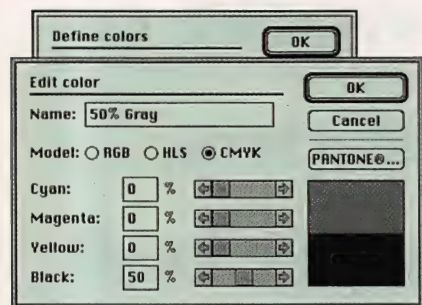
For more information or a free output sample, come into your nearest Tektronix dealer or call us at 800/835-6100, Dept. 31C. For faxed information, call 503/682-7450, and ask for document # 5001.

In closing, we just want to remind you that your competition is also reading this ad. And they're extremely hungry. So when choosing a presentation printer, the choice is quite simple. You can either eat, or be eaten. Bon appétit.

Tektronix

Phaser is a trademark of Tektronix, Inc. PostScript is a trademark of Adobe Systems, Inc. All other marks are trademarks or registered trademarks of their respective companies.

Circle 143 on reader service card



Going Gray Use PageMaker's Define Colors command with the CMYK option selected to create as many custom grays as you like for shading text.

Forced Justification

TIP In the past I've occasionally needed to force the justification of a single line in QuarkXPress but became frustrated because there is no command to do so. I achieved acceptable results playing with the flush zone, the option of the H&J command that can make the last line of text in a justified paragraph automatically extend to the right indent. But then I discovered that in a justified paragraph you can force justification simply by pressing shift-return. It works like a charm.

*Craig Forni
Granby, Massachusetts*

Feet Beat Heat

TIP My NEC CD-ROM drive heated up quite a bit until I placed four plastic soda-bottle caps underneath as feet. I used clear silicone glue to attach them securely. The gap they provide allows air to flow beneath the unit and cool it.

*Paul Lucchese
Hopewell Junction, New York*

Graying Text

TIP I was surprised the other day to hear a PageMaker 4 user complain about not being able to gray-shade text like QuarkXPress users do. It's so easy! In the Define Colors dialog box, select Black and click New. Select the CMYK option and set Cyan, Magenta, and Yellow percentages to 0. Set Black to whatever percentage you want, name the new color, and click OK (see "Going Gray"). Now you have a custom color on the Color palette that you can apply to text. I created a template with gray shades from 5 to 95 percent in 5 percent increments. When I need them, I either open a copy of the template or import the shades into a document with the Copy button in the Define Colors dialog box.

*Sam Mattes
Indianapolis, Indiana*

Empty Plates

TIP When you use QuarkXPress 3.11 to make color separations for a spot-color job containing Adobe Illustrator 3.2 art, blank cyan, magenta, and yellow plates may print in addition to the spot-color plates. The useless plates print if the original Illustrator art contains unused custom colors. To keep the blank plates from printing, open the Illustrator art, delete all unused custom colors, save the art, open the QuarkXPress document, and update the Illustrator art with the Update Pictures command.

*Philip D. Gruber
New York, New York*

We pay from \$25 to \$100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses. **m**

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Guide to System 7.1* (IDG Books Worldwide, 1992).

STILL TRYING TO FIND ...

Your assistant? The company van? The Sales Manager? Even in small offices keeping track of people and resources is a hassle. Wandering around peeking in doors wastes time! Instead, use **In/Out™** from PrairieSoft. It lets everyone know who's there and who's where. If you have more than three people and a Macintosh® network you **NEED In/Out**. Users can quickly and easily log in and out as they go about their daily tasks. Use it to track resources like VCRs or company vehicles. **In/Out** even includes an optional screen saver that's activated when you log out!

NAME	RETURNING	NOTES	DATE	TIME
Chandler, George	11:15 am	Phone call	Sep 22 93	11:15 am
Collins, Joe	1:00 pm		Sep 22 93	1:00 pm
Conrad, John	7:30	at airport for package	Sep 22 93	11:11 am
Evans, Tom	2:30	at airport	Sep 22 93	11:11 am
Hampton, Linda	Sep 22	Travelling	Sep 22 93	11:11 am
Thompson, John	4:00	Travelling Home	Sep 22 93	11:11 am
David, David			Sep 22 93	9:52 am
Johnson, Susan			Sep 22 93	8:38 am
Keller, Bob			Sep 22 93	8:15 am
Long, David		Open	Sep 22 93	11:11 am
Morgan, Mike			Sep 22 93	9:58 am
Smith, Sharon			Sep 22 93	10:13 am
Smith, Ted			Sep 22 93	11:11 am

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Circle 269 on reader service card

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Macworld

Until now, if you wanted serious QuickDraw acceleration, 24-bit color, 21-inch monitor support, and Photoshop acceleration, you had to bring your money in a wheelbarrow. Not any more. Announcing Tornado,™ the color graphics system that blows the competition away. Tornado combines all the most requested features for the demanding graphics user and delivers them at absolutely the lowest price in the world!

Awesome Graphics Power

For just \$799 you get lightening-fast 24-bit color graphics, along with state-of-the-art features like on-the-fly resolution switching, hardware pan and zoom, and an advanced design that even fits in a Centris 610/660. The Tornado supports monitors from 13 to 21 inches at resolutions up to 1152x870. Our Virtual Desktop feature can extend your workspace to 4096x2048 (in 1-bit). An inexpensive NTSC adapter** lets you connect Tornado directly to a television or video recorder.

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When you add the \$599 Mirror ChargeCard,™ you also get the world's best

Photoshop accelerator, still in a single slot! The ChargeCard uses two 60 Mhz DSPs to

accelerate time-consuming Photoshop functions by up to 2000%.*

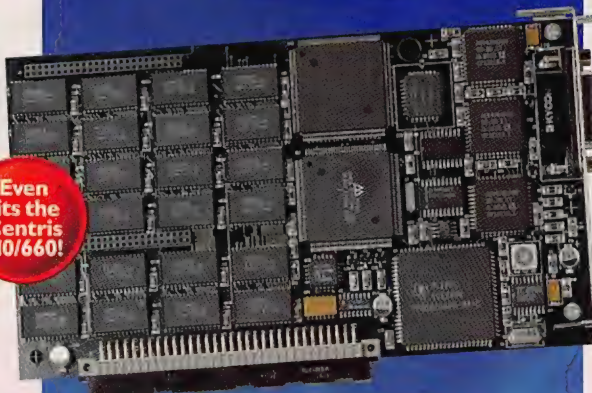
PowerPreview™ software saves even more

time by allowing you to test filter settings before you process the entire image. Because it's AdobeCharged,™

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Picture The Performance

Designed as a perfect match for the Tornado Graphics Card, the new Mirror ProView 21-inch Color Display will satisfy the most discriminating user. Its razor sharp

21-inch screen, digital controls and full multi-syncing features give

you an expansive, brilliant view of your work. Priced hundreds less than

comparable displays, the ProView 21 can also be used with the built-in video of the Centris and Quadra series.



The new ProView 21-inch Color
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Mirror Color Systems

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ChargeCard Photoshop Accelerator†	\$ 599 NEW
Tornado/ChargeCard Bundle	\$1299
NTSC adapter for Tornado††	\$ 99 NEW
ProView 21-inch Display	\$2099 NEW
ProView 20-inch Standard Display	\$1399
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SuperMac, Radius and RasterOps are all hundreds (even thousands) of dollars higher. Buy direct from Mirror and keep the savings for other fun stuff. All Mirror products include lifetime technical support and the confidence that comes from dealing with a company that's been in the Macintosh business since 1985. Every Mirror product is backed by our 30-day "love it or return it" satisfaction guarantee.

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tech support: 612-633-2105

*Requires a multi-sync monitor.
**Varies, depending on CPU speed, file size, hard drive transfer rates and available RAM. †Requires Tornado board.
††NTSC adapter available December 1993.
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Circle 124 on reader service card

Don't let our low prices fool you! Mirror displays represent the best combination of performance, features, and price that you'll find anywhere. Unlike some companies who claim to be experts at everything from networks to luggage, Mirror focuses on delivering the best in Displays and Scanners. As a result, the magazines consistently point to Mirror displays as the best value.

Big-screen Debut

We are always auditioning bright new talent, and are proud to introduce our newest big-screen performers, the 15-inch ProView Color Portrait Display and the ProView 21-inch Color Display.

The Color Portrait Display is the answer to many users' prayers for an inexpensive monitor that will show a full page in brilliant color.

The ProView 21-inch represents the current state-of-the-art in color displays, with 1152 x 870 resolution on a razor-sharp flat-square screen, digital controls, and environmentally-friendly power-

saving features. The ProView 21 actually detects the absence of an operator and puts the monitor in energy-saving sleep mode.

Brilliant Color Creations

If you agree with Ted Turner that everything looks better in color, be sure to check out our complete line-up of color displays.

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From our value-priced 14-inch Color to the stunning ProView Trinitron and the amazing ProView 21-inch, we offer six different color displays to fit any requirement.

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21-inch	\$2099	\$2799	NEW
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MIRROR DISPLAYS FOCUS ON OUR PERFORMANCE

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15-inch Full-page	\$399	\$549
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Black & White Classics

Nothing beats a black & white display for image sharpness and value. Our monochrome and grayscale displays (Full-page and Two-page models) are available for most Macintosh models, starting at just \$399.

Matching Boards At Matchless Prices

Mirror displays can be used with the built-in video of newer Macs. Or you can combine them with one of our precision-engineered video cards like the Mirror Tornado. Tornado delivers

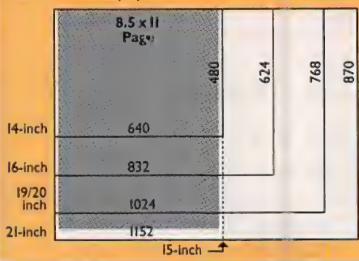
dazzling 24-bit color performance for a shockingly low price and optional Photoshop acceleration.

Mirror has been selling displays for the Mac longer than any other direct marketing company. And because we cut out the dealer markup, you save big on your big screen. (Kind of like seeing a Spielberg film at a 99¢ theater—GREAT performance, LOW price.)



What Size Do You Need?

This chart compares the workspace available on each Mirror display



Award-winning Quality



Full-page Display
Macworld, May '93



Full-page Display
MacUser, July '93



Two Page Display
MacUser, July '93

Circle 125 on reader service card

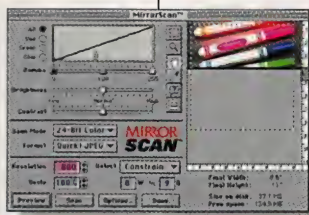
When Macworld's experts tested a field of 14 color scanners, they concluded that you don't have to pay a lot to get a good scanner; you just have to call Mirror.

The Best Hardware

Mirror's award-winning scanners start with a precision three-pass scanner engine for superb color registration and sharpness. Then we add hardware pre-scan gamma correction for top quality results in much less time. The Mirror Color Scanner is available in 600, 800 and now 1200 dpi models to fit every budget.

The Mirror Color Scanners can also scan slides and transparencies. Simply replace the standard cover with the optional

Transparency Adapter and you are ready to scan transparencies up to 8.5"x11.7".



MirrorScan's powerful features make scanning a snap

The Best Software

Having great hardware doesn't get you much unless you've got great software.

Our exclusive MirrorScan software delivers. No other scanning software can match

our features. From full-color previews and interactive gamma controls, to built-in JPEG

Mirror Color Scanner

\$1099
from
(includes Photoshop 2.5 and Read-It! OCR)



and Fast-Eddie compression, user-definable custom selections and support for EPS, TIFF and PICT file formats, MirrorScan makes it easy to get great scans.

Every Mirror 600, 800 and 1200 scanner includes the Plug-in, application and desk accessory versions of MirrorScan, along with a full version of Adobe Photoshop 2.5 and Read-It! Pro 3.0 OCR.



THE EXPERTS CALL IT A BARGAIN WE CALL IT THE MIRROR COLOR SCANNER



Mirror Coolscan Slide Scanner

\$1999
complete

The Coolest Scanner Of All!

If you need to scan 35mm slides, you'll want to check out the new Mirror Coolscan™ ZFP System. Based on the amazing Coolscan technology from Nikon, this scanner is the first to bring professional quality color scans to your desktop for under \$2000! Its remarkable color sensitivity, patented solid-state light source and 2700 dpi resolution will bring your work to life with stunning scans from slides or negatives.

The Mirror Coolscan is the same size as a standard hard drive and includes everything

you need to start scanning right away.

The Coolscan application and Photoshop Plug-in module incorporate sophisticated image controls for top notch results every time.

The Best Deals

Don't pay dealer markup! Buy direct from Mirror and keep the savings for other cool stuff. Every Mirror product is backed by our 30-day "love it or return it" satisfaction guarantee.

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*Editors Choice, Macworld, Nov '93, 5 Apple, MacHome Journal Nov '93, 4 Mac, MacUser UK Oct '93, 43 Mac, MacUser, Nov '93, 4 Star, Macworld, Dec '93. All prices subject to change. Prices are for US orders only; call for international pricing.

Circle 122 on reader service card

EDITED BY ELIZABETH DOUGHERTY

Networks

THE LATEST IN CONNECTIVITY AND COMMUNICATIONS

Picture This: Networking over Cable TV

AN ALTERNATIVE TO USING EXPENSIVE dedicated telephone lines to carry data beyond your office is on the way: the cable television network.

Since last year's court ruling allowing cable television carriers to also sell information services, cable TV companies and hardware and software providers have been racing to come up with network and information services that use this existing broadband network. Among the goals are hooking telecommuters into the company network; connecting into the worldwide Internet; piping homework lessons into your kids' computer; and helping companies distribute product information, services, and electronic-media products to consumers.

Because cable television facilities are controlled by different companies in different counties or regions, not all services will be available in all parts of the country. And until cable companies begin making agreements to carry one another's services, network traffic on a cable link is limited to the scope of a franchise.

So far three ventures have announced cable network products. For \$99.95 per user, per month, Hybrid Telecommuter Service (408/725-3250) offers San Francisco Bay Area telecommuters one-way cable access to their corporate TCP/IP networks. Telecommuters attach their computers to the cable TV wire using the Model 100 Remote Link Adapter (\$1495 each for both Macs and PCs) to receive data from the office network. They send replies over a standard 9600-bps telephone-modem connection. Two-way services via cable and wider service areas are under development.

Zenith Electronics Corporation's HomeWorks system, on the other hand, lets organizations make two-way LAN connections with housebound students,



patients, or telecommuting workers through cable television feeds. The HomeWorks PCTV-R gateway card and RF modem, a \$495 modemlike device that connects the computer to the cable, can be "tuned," like a television, to up to four different data channels. It sends and receives data at .5 Mbps, which is faster than standard or ISDN modems, but slower than a LAN. Organizations feed their services into the cable network by setting up a LAN server at a cable television office. HomeWorks supports NetWare, TCP/IP, IBM LAN Server, Microsoft LAN Manager, and IBM Server. Currently, HomeWorks services are available through TCI Cablevision of Utah, and Zenith is negotiating with other cable operators. Cable operators will determine pricing for their carrier services separately.

Performance Systems International (PSI) and Continental Cablevision are teaming up to bring 10-Mbps full Internet access to cable-ready homes and businesses in eastern Massachusetts by early 1994, with other areas following as PSI develops further agreements. With PSI equipment, home computer users will be able to tap into the vast resources of the 15 million-node Internet to send and receive E-mail, participate in international forums, and access research databases and the Library of Congress card catalog. Through a new technology called Asynchronous Transfer Mode switching, PSI and Continental hope to eventually offer access at such high speeds that customers will be able to request and transfer videos over the network to their television sets. Performance Systems International, 703/904-7187.—MARGIE WYLIE

Shared Dial In, Dial Out

NETWORKS THAT SUPPORT POWER-Book nomads and Macintosh telecommuters clamoring for access to resources on the corporate LAN might be able to use Shiva Corporation's LanRover/E2.0 for AppleTalk Remote Access. An upgrade to the original LanRover network server, version E2.0 comes in four-port (\$2495) and eight-port (\$3499) models. Version E2.0 was scheduled for release in November 1993.

Both models are designed to support dozens, or even hundreds, of mobile users who depend on reliable, transparent access to databases, E-mail services, and file servers on their enterprise networks.

The upgrade includes built-in IP gateway functionality, which gives dial-in users direct access to TCP/IP services, and beefed-up password capability so network managers can set password expiration dates and users can change their own passwords. Also, with the new version, network managers can designate which zones and devices remote users can access.

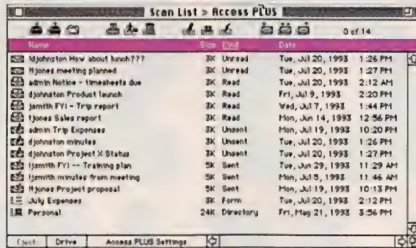
Cost-containing measures include shared dial-out capability, a standard feature on related Shiva products. Shared dial-out lets Macintoshes on the LAN use the modems connected to the Lan-



Shiva's upgraded network server, LanRover/E2.0, offers ARA access through four or eight ports.

Rover/E2.0 to call electronic services whenever remote users aren't using the modems to dial in.

For \$250, owners of the previous version can upgrade to LanRover/E2.0. Shiva, 617/270-8300.—MARTHA STRIZICH



AT&T's improved Mac software for its EasyLink message service offers a more Mac-like interface.

Easier E-Mail from AT&T

AT&T HAS REDESIGNED ITS EasyLink communication software so the interface is more Mac-like, which means Macintosh users can learn the program faster. Other enhancements make it easier for subscribers to access the various EasyLink E-mail services.

The new \$210 version of the software, called Access Plus, lets users attach multiple files—binary or text—to a single E-mail message. The attachments can be as large as 10MB, a fivefold increase over the previous 2MB limit. Access Plus also includes more directory options, the ability to send or receive messages automatically, and a hot key that calls up a window where you can compose a message and send it to an outgoing E-mail queue without leaving the active application.

Owners of the previous version of the software, Access III, can upgrade for \$99 until the end of 1993. AT&T; 800/242-6005, 800/567-4672 in Canada.

—MARTHA STRIZICH

IN BRIEF

■ **SNMP Version 2 Is Arriving** By the end of 1993, the Wolong Group plans to release version 3.1 of its \$10,000 PathWay Management Station—open, distributed network-management architecture—which supports SNMP version 2. The long-awaited protocol provides enhanced network-management security and more efficient transfer of management information. 415/962-7156.

■ **Mac-to-VMS Services** Pacer Software released version 9.0 of its quartet of Mac-to-VMS file- and print-server software. The new programs install more easily and offer simpler configuration and management. PacerLink and PacerConnect also give more control over start-up and shutdown. PacerShare for VMS lets Macintosh users mount and use VMS directories as if they were Mac disks. PacerPrint version 9.0 supports Apple's LaserWriter driver version 8.0 and allows Macs to print to VMS printer queues and lets VMS users send jobs to Mac printers. Prices start at \$3750 for a 20-user PacerShare license. PacerConnect costs \$2000 per host. 508/898-3300.

■ **LANauditor Expands Base** Version 3.0 of Horizon Technology's LANauditor can now inventory Mac, OS/2, and Windows for Workgroups desktop computers. It also provides more-detailed information on DOS/Windows PCs and audits file-server hardware and software. From \$495 for up to 50 workstations. 619/277-7100.

A Router & ARA Server in One

THE UPGRADED MULTIPORT/LT FROM Webster Computer Corporation rolls a LocalTalk router and an Apple Remote Access server into one.

Its predecessor, the MultiPort Gateway, was simply a LocalTalk router (see "Rating Routers," *Macworld*, July 1993). The new \$1995 product is a four-port device about the size of a dictionary. Network managers can use all of the ports to segment a large LocalTalk network into four smaller, faster networks. Or they can reassign any of its ports to serve as ARA connections, so Macintosh users can dial

into their corporate LAN from home or on the road. Like its predecessor, the MultiPort/LT also lets LocalTalk-connected Macintosh users access Unix and VMS host computers via TCP/IP and DECnet protocols.

The upgrade comes with a point-and-click application called MultiPort Manager, which lets managers configure MultiPort/LTs and Gateways over the network from any Mac.

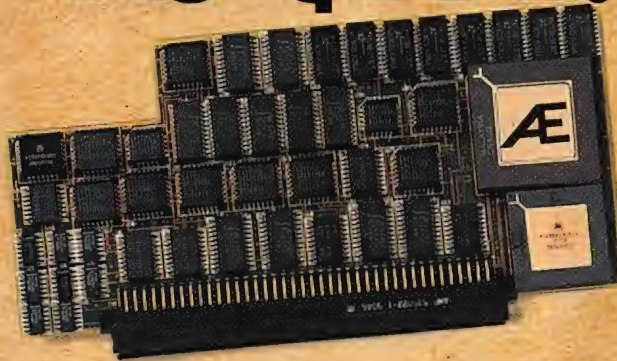
The MultiPort/LT has been available since July; the network-management software was slated to be available in

November 1993, as a free upgrade for owners of MultiPort/LT. MultiPort Gateway owners who want to swap for a MultiPort/LT unit should contact the company for pricing. Webster Computer, 408/954-8054.—MARTHA STRIZICH



In MultiPort Manager you configure MultiPort routers by clicking on a button and filling in a dialog box.

QUADRUPLE YOUR MAC'S SPEED FOR AS LITTLE AS \$199.



No wonder the competition is running for cover.

Nobody makes faster 040 and 030 accelerators than we do. *Nobody!* And our broad product line means there's one to fit your specific needs.

At a price that will fit your budget.

For maximum computing power, our PDS-based 68040 accelerators will blast your Mac beyond Quadra 950 speeds without sacrificing compatibility. And you can add a fast 128K cache for even more speed.

Or take our new 25MHz SE/Classic Accelerator. For about half the price of DayStar's entry-level accelerator, it more than *quadruples* the speed of your SE or Classic. And starting at just \$399, our LC accelerators are another spectacular value.

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4340	LC Series	68030	40	3.25	\$ 399
6425	IIci, IIsi, IIVx	68040	25	4.5	\$ 829
6440	IIci, IIsi, IIVx	68040	40	5.5	\$1199

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Circle 167 on reader service card

Take
control of
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Macs with
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At Ease 2.0 for Workgroups

by Kee Nethery

At Ease, Apple's alternative to the Finder, was originally designed in 1992 for Macs in homes and schools. Its large icons representing applications and documents combined ease-of-use with security. Parents and teachers could make Macs accessible to young users and at the same time rest easy knowing that the system setup, applications, and important documents were protected. But At Ease has proven to be more than kid stuff. At Ease 2.0 for Workgroups lets a network administrator configure ten Macs for up to 1000 users with 200 different setups of applications and documents per workgroup.

Why At Ease?

One of the Mac's greatest strengths—its ease-of-use—also holds potential disaster.

Novices can accidentally delete or move files, and experienced users can customize the Mac beyond recognition. This may not be a problem if each Mac has only one user, but if each Mac is available to several users, you're flirting with trouble. At Ease 2.0 for Workgroups gives you the ability to configure a Mac or a group of Macs for a specific task. You can easily vary which users have access to applications, documents, or aspects of the system software.

In addition to being a valuable tool for educators, At Ease 2.0 for Workgroups is well suited for a business whose employees use only one particular application. For example, a company, or a department within a company, that deals with a specific task, such as order entry, customer service, or forms processing, is an ideal candidate for At Ease 2.0 for Workgroups.

At Ease 2.0 for Workgroups is easy to configure. The difficulty lies in altering your view of the Mac. The trick is to see it as a public tool used by many people, not as a personal computer with system software that's easy to access and customize.

Any Mac on the Network

If you're a network administrator, you can use At Ease 2.0 for Workgroups to configure a group of Macs to provide each user with a separate log-in name, password, and set of documents, but access to the same applications as other users. You can place an alias of your company's database-management software, for example, in the start-

WILL CROCKER

up folder of each Mac and have the start-up items open after a user logs in. In this case, no one, except support personnel, needs or is allowed to use the Finder. Network-administration and security features are available from any Mac on an AppleTalk network.

This configuration has many maintenance benefits. Each Mac remains untampered with and free of incompatible software and INITs. When people leave the company, it's easy to find and archive their documents. Training is reduced to just the relevant applications. If the administrator keeps user data and setup information on a single file server, people can use any available Macintosh. Since the network administrator installs the necessary applications on each hard drive, users avoid the performance decrease of running applications from a file server.

Back to School

The first version of At Ease did not meet all the needs of school computer-lab managers because it assumed a person, not an organization, owned each computer. The new version addresses that concern.

Where else but in a school might you find 1000 users for just ten computers? A school's computer-lab manager can give each student a log-in name and configure a setup for each class. You can configure At Ease 2.0 so that students save documents on their own personal floppies and nowhere else. The previous version of At Ease did not allow for folders, so anything inside a folder on a floppy disk was inaccessible. Version 2.0 supports nested folders, so students can customize their organization of folders to meet their needs both at school and at home, if they have their own Macs. Since each computer can have the applications that students are allowed to use, and students cannot change the printer selection, you can make the Mac as bulletproof as possible.

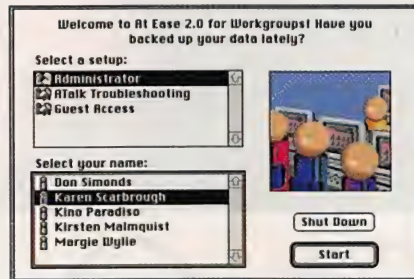
You can also configure At Ease 2.0 so that when students log in for the first time, they must create their password, and so that At Ease rejects easy-to-guess passwords, such as their own first or last names, sequential keyboard characters (for example, 12345 or QWERTY), or a series of the same numbers or letters (for example, 11111 or XXXXX). The At Ease log-in message can be customized daily to remind students of school activities.

Things to Think About

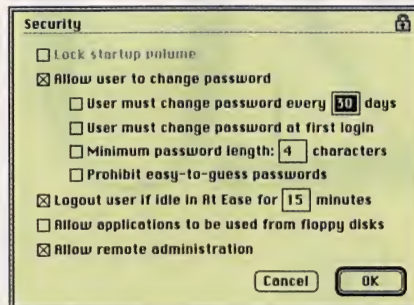
Before you install At Ease 2.0, consider whether or not you need to protect the hard drive's start-up volume. For a network with Macintoshes that anyone can access, securing the start-up volume is often essential. At Ease can lock the



Applications The first At Ease window gives the user access to the applications and documents specified in the folder called Click on These.



Log In When the Macintosh starts up, this is the first window the user sees. The administrator can change the message at the top of the window.



Access At Ease 2.0 for Workgroups offers a variety of security options.

start-up volume to prevent a user with start-up floppies from bypassing the At Ease log-in and gaining direct access to the hard disk.

You can lock the start-up volume on the hard disk only if the existing SCSI driver is compatible with At Ease 2.0 for Workgroups. At present, only Apple HD Setup and Casa Blanca Works Drive7 format the drive in a way that lets At Ease lock the Mac's start-up volume. Any hard drive formatter is acceptable if you do not need to lock the start-up disk.

Since At Ease inserts code to replace the Finder, you must use the Installer to install and remove At Ease. Once you've installed At Ease, never drag the At Ease extension out of the System Folder. When you start up the Mac, the system software looks for the At Ease extension and will freeze up if it doesn't find it.

At Ease 2.0 for Workgroups offers

three installation choices: you can opt for the basic At Ease configuration (sufficient for most users), or you can add support for a mouse-training program (though a good game is probably a better mouse tutorial), and you can add talking buttons. How do talking buttons work? As your mouse passes over one, the Mac speaks the name of the button or plays a custom sound. If you don't need cute talking buttons or a tutorial on using a mouse, save the disk space.

A Sense of Security

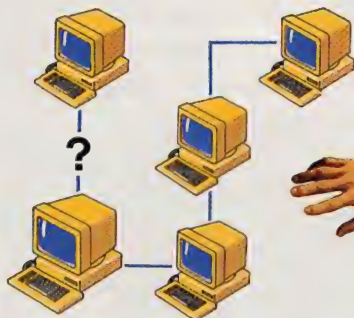
Many companies will want At Ease 2.0 for Workgroups just for its security features. At Ease will not stop a determined data thief, but it does provide a valuable amount of access control. Like most aspects of At Ease 2.0, the setup for access control is simple. For example, you can set up At Ease 2.0 to grant guests access to only basic software and configure another setup that lets regular users access the Finder immediately. You can administer a variety of password tricks such as requiring a minimum length (up to 15 characters) and setting a password expiration date (for example, you can require users to change their passwords every day). You can also prevent users from creating easy-to-guess passwords.

At Ease 2.0's ability to monitor user actions—such as log-ins, attempted log-ins, attempts to run the setup program, and application launches—helps you scan for unauthorized access or, more likely, justify the purchase of additional computers by monitoring the number of users accessing Macs in the workgroup.

At Ease 2.0 for Workgroups costs \$295. This licenses you to use the software on ten Macs. If you have more than ten, you must purchase additional copies. Although System 7 is required, At Ease does not add to the Mac's memory requirements; it runs in the memory normally used by the Finder. The single-user version costs \$59, but even with only one computer, you may want to buy the workgroup version because it offers more configuration options and better security.

At Ease started out as a home and educational computing tool to allow kids to access a computer without destroying its data, but it has moved beyond this environment to become a valuable tool wherever Macs are used as public computers. If you maintain a network and have more users than you do Macs, take a look at At Ease 2.0 for Workgroups. **m**

KEE NETHERY of Kagi Engineering in Berkeley, California, provides networking support and training for the administrators of large, multi-protocol networks.

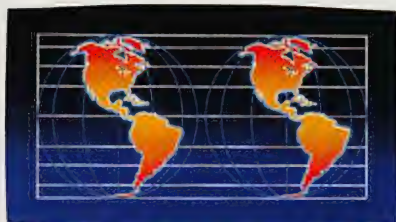


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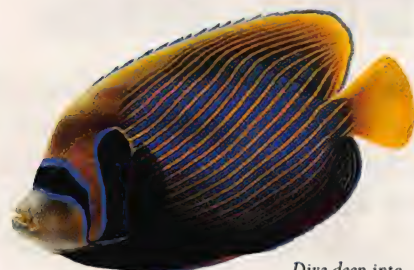


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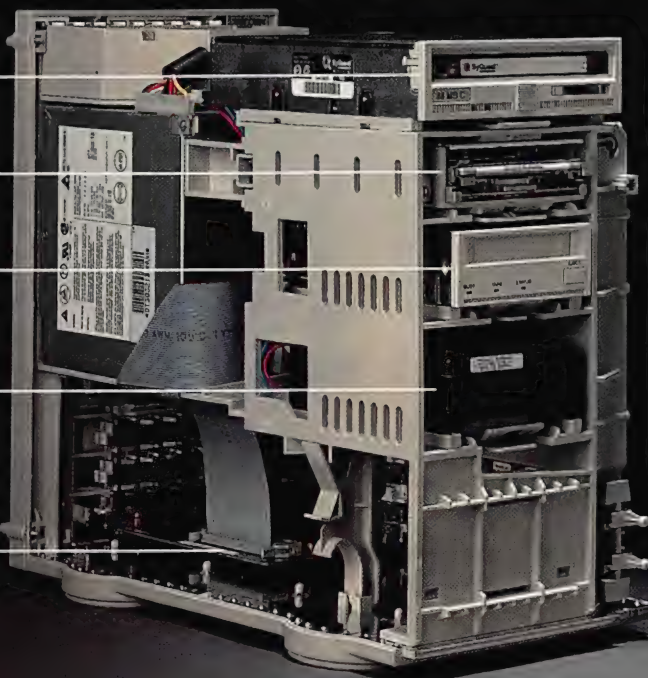
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Disk arrays can improve performance up to 400 percent over standard drives. Combine MicroNet's Raven-800 disk array with the speed of the Quadra 800/840av and you have an unbeatable system for audio recording, full rate digital video, and graphics applications such as PhotoShop.

Cost effective two drive disk arrays are available in capacities of 1030 to 5560 MBytes and are expandable to more than 38 GBytes. MicroNet offers Raven upgrade kits for existing MicroNet or factory installed Apple 500 or 1000 MByte drives.

Built on award winning technology, the Raven-800 takes full advantage of Apple's existing hardware. One drive connects to the native SCSI port of the Quadra, and one connects to a MicroNet NuPORT-III, SCSI-2 host adapter. Together, these two drives create a fast, parallel, 16-Bit data path.

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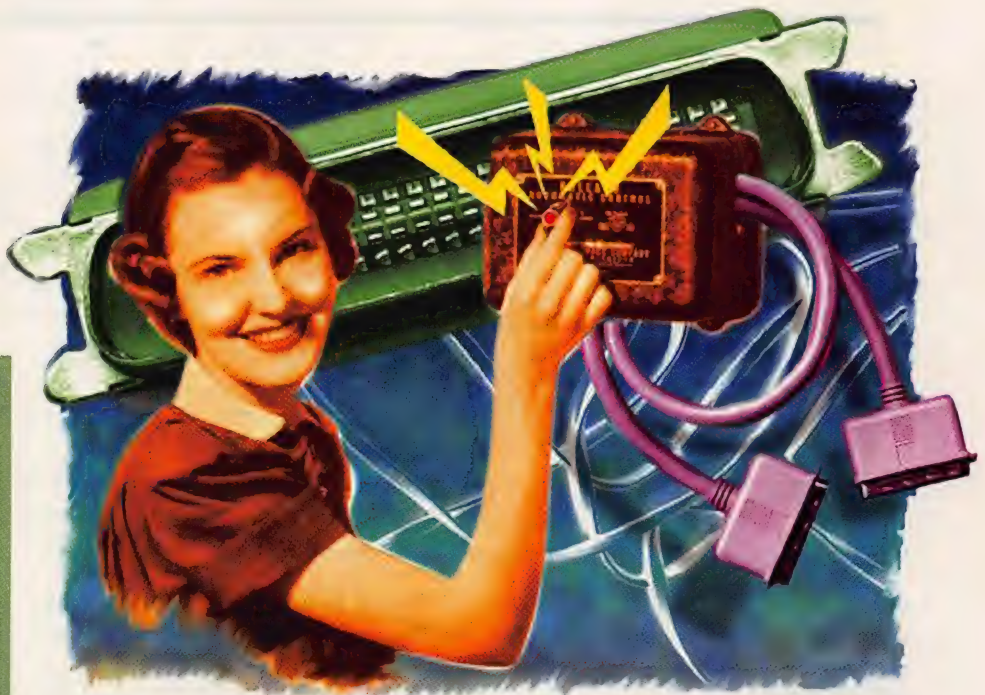


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Circle 113 on reader service card

THE SCSI-TO-ETHERNET CONNECTION



Short on slots? Take the SCSI route to faster networks.

BY JOEL SNYDER

eed to upgrade your LocalTalk network to Ethernet speeds, but can't spare internal slots for network interface cards? Use the SCSI bus.

While many Macintoshes don't have enough internal slots to go around, nearly all Macs (except the venerable 128K, 512K, and the new PowerBook Duos) have external SCSI connectors.

Eight companies sell 17 different SCSI-to-Ethernet adapters at prices ranging from about \$200 to \$700. With the SCSI port on one side of these boxes connected to a Mac, and the Ethernet port on the other side connected to a network cable, Macs that already have a full complement of internal cards (or even those built without internal slots) can be networked at speeds several times faster than LocalTalk's.

Despite the \$500 price range, all 17 adapters do basically the same thing at similar performance levels. Some

SCSI-to-Ethernet adapters perform better than others, but the variations are so minute that you probably won't notice them. Instead, look for features that suit your particular needs, such as types of Ethernet connectors supported, configuration flexibility, form factor, and compatibility.

ANDREW FAULKNER

Connector Support

Ethernet networks generally use a combination of different wires (media). Each wire type—including 10BaseT (twisted pair), 10Base2 (colloquially dubbed thin net), and 10Base5 (thick net)—has its own type of connector. To accommodate the variety of network media, adapters come in several different configurations, offering connectors for one, two, or all three types of wire. ("SCSI-to-Ethernet Adapters Compared" shows which connectors each adapter supports.)

Dayna is the most flexible in this area, with its DaynaPort

SCSI-to-Ethernet Adapters Compared

CONNECTORS

Company	Phone	Product	Size (w × l × h, in inches)	Weight	10BaseT	Thick	Thin	SCSI Termination	Number of SCSI Connectors
Asanté	800/662-8686	Mini EN/SC	3 × 4.5 × 1	6 oz.	●	○	●	switchable	1
		Mini EN/SC-10T	3 × 4.5 × 1	6 oz.	●	○	○	switchable	1
Cabletron	603/332-9400	EA412	3.5 × 6 × 1	8 oz.	●	○	●	switchable	1
		EA414	3.5 × 6 × 1	8 oz.	●	○	○	switchable	1
		EA419	3.5 × 6 × 1	8 oz.	●	○	○	switchable	1
Compatible Systems	303/444-9532, 800/356-0283	Ether+ (Thick/10BaseT)	5.5 × 7.5 × 1.5	26 oz.	●	●	○	always terminated	1
		Ether+ (Thick/Thin)	5.5 × 7.5 × 1.5	26 oz.	○	●	●	always terminated	1
Dayna	.801/269-7200	DaynaPort SCSI/Link	2 × 3 × 6	12 oz.	○	○	●	switchable	2
		DaynaPort SCSI/Link-3	2 × 3 × 6	12 oz.	●	●	●	switchable	2
		DaynaPort SCSI/Link-T	2 × 3 × 6	12 oz.	●	○	○	switchable	2
Farallon Computing	510/814-5000	EtherMac SCSI (PN 570/571)	2 × 3 × 6	12 oz.	○	○	●	switchable	2
		EtherMac SCSI (PN 572/573)	2 × 3 × 6	12 oz.	●	○	○	switchable	2
Focus Enhancements	617/938-8088	EtherLAN SC	5.5 × 7.5 × 1.5	26 oz.	○	●	●	always terminated	1
		EtherLAN SC-T	5.5 × 7.5 × 1.5	26 oz.	●	●	○	always terminated	1
MaCNet	408/954-8888, 800/486-2638	SCSI-490	4 × 6.5 × 1.5	24 oz.	●	○	●	switchable	2
Technology Works	512/794-8533 800/688-7466	Ethernet SC	5.5 × 7.5 × 1.5	26 oz.	○	●	●	always terminated	1
		Ethernet SC-T	5.5 × 7.5 × 1.5	26 oz.	●	●	○	always terminated	1

● = yes; ○ = no; NA = not applicable. * Price includes PowerBook cable and desktop cable.

SCSI/Link-3. The SCSI/Link-3 is the only SCSI-to-Ethernet adapter that offers connectors to all three types of wire, in one small box.

The Cabletron EA414 is the only adapter compatible with fiber-optic cabling and the FOIRL (Fiber Optic Inter-Repeater Link) standard.

Configuration Flexibility

Most SCSI-to-Ethernet adapters automatically sense which Ethernet media has been connected and set themselves accordingly. All the autosensing adapters I looked at worked fine except the Cabletron EA412, which required manual intervention some of the time.

Two companies make adapters that don't sense which kind of network is attached, but the Compatible Systems design (also sold by Technology Works and Focus Enhancements) requires the most fussing. Changing its media type requires removing two screws, changing a jumper, and replacing the screws. The MaCNet adapter has a switch on the back that simplifies the process somewhat.

Connecting devices to a SCSI chain requires some flexibility. One device usually isn't a problem, but when you have a string of them you must get the SCSI IDs, termination, and all the possible connectors right.

All of the adapters tested have a switch to select SCSI IDs. When adding an adapter to an existing Macintosh, remember that SCSI ID 7 is reserved for the Macintosh CPU, while SCSI ID 0 is usually assigned to the internal hard disk.

Dayna, Farallon, and MaCNet adapters have the greatest SCSI connection flexibility. Their adapters allow either a terminated or an unterminated SCSI chain, and each adapter has two SCSI connectors. That makes it simple to plug one of these two connectors into an existing chain of SCSI devices. Other companies' adapters require special Y-cables (included with Asanté adapters, optional with all the other adapters) or don't allow for the adapter to be anywhere but at the end of a SCSI chain.

Portability

For administrators who tote PowerBooks around the network, or for other users on the go, the size and weight of the adapter is crucial. Asanté's adapters, each the size of a small paperback book, weigh in at a light 6 ounces. Cabletron's are only a few inches longer and a couple of ounces heavier, but cost anywhere from \$150 to \$350 more.

For the PowerBook user, the external transformer can be heavy, and an AC outlet has to be available at all times. Since all but one of the SCSI-to-Ethernet adapters use the same power connector and a 12-volt power supply, you can get around the outlet restriction by powering your adapter with a 12V battery pack (eight AA-batteries). Unfortunately, such a pack weighs about the same as a transformer, if not a little more.

Watch out for another PowerBook quirk: PowerBooks require an unusual SCSI cable. Some companies sell PowerBook versions of their adapters, which

simply include the special cable, at a higher price than adapters that include a standard Mac SCSI cable. Others sell the cable as an add-on, for as much as \$50 extra. Asanté solves the problem by including both PowerBook and standard Mac cables with all of its adapters.

Compatibility

In most cases all of the adapters performed flawlessly on all platforms tested. But two did experience problems: The DaynaPort SCSI/Link-3 usually worked fine, but did randomly fail some tests, crashing the Macintoshes and twice bringing down the entire AppleTalk network. Eventually the adapter worked, but Dayna wasn't able to isolate the cause of the crashes. The Cabletron EA412 worked well on the Macintosh II but was unable to receive large files over TCP/IP when connected to a PowerBook.

Performance Issues

In general use, all the adapters I tested turned in equivalent performances.

Transferring data to a Macintosh disk from the network performed quite poorly, between .18 and .28 Mbps. Transfers from Macintosh disks out to the network were much faster, ranging from .17 to .48 Mbps.

For TCP/IP and AppleShare network applications, it doesn't matter what adapter you buy: they all run at about the same speed. For special-purpose applications, such as Ethernet protocol-analysis, the Asanté Mini-series adapters turned in the fastest performance, while the Com-

Media Switching	Price (w/ PowerBook Cable)	Price (w/ Desktop Cable)
automatic	\$459.00 *	\$459.00 *
NA	\$369.00 *	\$369.00 *
automatic	\$612.00	\$570.00
automatic	\$717.00	\$675.00
NA	\$567.00	\$525.00
manual	\$545.00	\$520.00
manual	\$545.00	\$520.00
NA	\$429.00	\$399.00
automatic	\$499.00	\$469.00
NA	\$429.00	\$399.00
NA	\$359.00	\$339.00
NA	\$359.00	\$339.00
manual	\$224.98	\$211.98
manual	\$244.98	\$231.98
manual	\$299.00	\$279.00
manual	\$429.00	\$399.00
manual	\$429.00	\$399.00

patible Systems (and Technology Works and Focus Enhancements) adapters did the worst.

Decisions, Decisions

If your budget isn't tight, consider buying Asante's Mini EN/SC. The smallest and lightest of the bunch, it is priced toward the middle of the pack. Plus, it comes with a high-speed driver, which gives it a significant performance edge in a few applications.

For applications where different media could show up at any moment, the DaynaPort SCSI/Link-3 (\$499 for PowerBooks) is an obvious choice because it offers every possible connector in one box. Be careful, though: Dayna may not have worked all the bugs out of this one. Test in your own environment before buying.

If you want to use the most common networks, AppleTalk or TCP/IP, from a desktop Mac and you aren't picky about the refinements, the Focus Enhancements EtherLAN SC adapter is the best choice. The EtherLAN SC (based on the Compatible Systems Ether+ design) is more difficult to configure, heavier, and slower than many of the other adapters; but for basic functionality, the \$225 price is hard to beat. So, pick an adapter and put even your slotless Macs on Ethernet through SCSI today. **m**

JOEL SNYDER is senior analyst with Opus One, a consulting firm located in Tucson, Arizona. He specializes in networks and international aspects of information technology.


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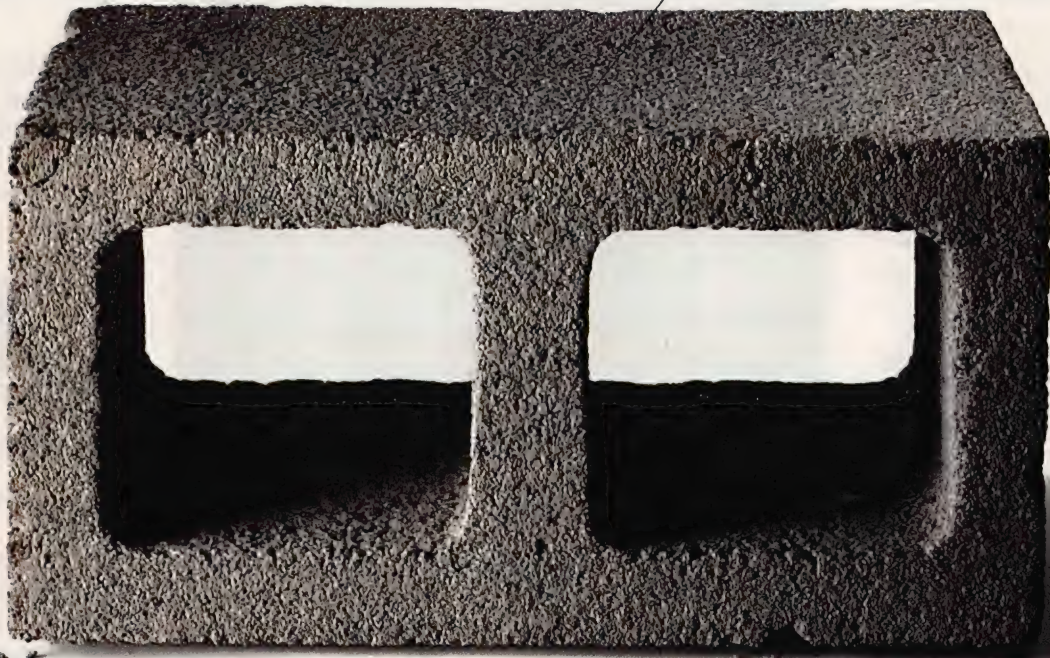
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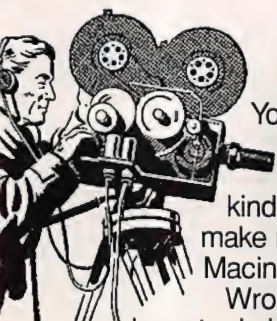
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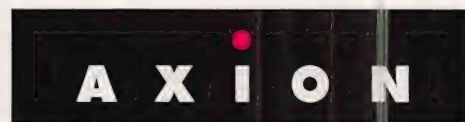


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PowerBook

Notes

Taking Care of Your PowerBook

A POWERBOOK PRETTY MUCH WORKS wherever we do. If we can stand the physical environment, so can a PowerBook—with a few exceptions, such as exposure to water. Yet a PowerBook does require some basic maintenance, as well as protection against the occasional hard knocks of everyday life and temperature extremes.

Routine Care

A PowerBook has two mechanical parts that users need to maintain: the trackball and the disk drive heads. You should clean the trackball from time to time (whenever pointer movement becomes erratic) by removing the retaining ring and carefully going over the rollers with a cotton swab moistened (not dripping) with isopropyl or ethanol alcohol.

Several companies such as Allsop and 3M sell head-cleaning kits that use a polyester disk and isopropyl alcohol solution. Floppy drive vendors consider these wet-cleaning disks better than dry ones. Apple recommends the 3M Diskette Head Cleaning Kit (\$9.95, good for 15 cleanings, according to 3M). Apple apparently hasn't tested competing cleaning kits.

How often should you clean the heads? The 3M manual says after every 40 hours of computer operation or once a week. Such frequent cleaning will sell a lot of kits, but 3M offers no statistical or other evidence to justify it. The cleaning frequency depends on your work environment. In an office with heavy cigarette smoke and other airborne contaminants, regular cleaning may be necessary. 3M claims that 80 percent of all read-write problems can be traced to dirty heads, a figure that seems high to the computer service technicians I consulted, most of whom say that dirty heads are not common. In 15 years of using desktop computers, I have seen only one situation



cured by cleaning the floppy drive head, in a chain-smoker's office. I have cleaned my own floppy drives only twice, both times because I was writing about cleaning kits. The PowerBook is less susceptible to dirt than a desktop Mac because the PowerBook disk drive has a door that keeps out stray dust.

To use a cleaning disk, you put a few drops of alcohol on the disk and insert it into a floppy disk drive. The idea is to spin the cleaning disk for 30 to 40 seconds. This causes two problems. First, the Mac can't read the disk, so you get a "This disk is unreadable" dialog box. Whatever you choose in the dialog, the Mac ejects the disk and you must reinsert it. Each time you insert the disk, the drive head is loaded on it for about 8 seconds; you must insert the disk four times to get 3M's recommended 30 seconds of cleaning time. Second, because the floppy disk head is always loaded on the same track, that track gets dirtier and dirtier and less efficient at cleaning while the rest of the cleaning surface remains unused.

Several companies produce software that will keep the head loaded for cleaning and also move the head around to spread the dirt. The least expensive is Drive Cleaner from Seven Hills Software (904/575-0566, 800/200-4555), which sells for \$34.95 and includes a 3M cleaning disk—the software at least doubles the number of cleanings from the disk.

Another package is DriveTech from MicroMat Computer Systems (415/898-6227, 800/829-6227), which sells for \$59.95 and also includes a 3M cleaning disk. Apart from the cleaning function, DriveTech also includes two calibrated floppies with a diagnostic program that essentially tells you if the floppy drive heads are positioned correctly.

Carrying a PowerBook

What is the most common cause of damage to a PowerBook? Probably dropping it. You can minimize the risk with a suitable carrying handle or case, of which there are five main types.

- **Simple handles and straps** These products attach to the screws in the bottom of a PowerBook; they are suitable for short distances; for long trips, you really need a larger case. Handles eliminate the need to carry a completely bare PowerBook, the likeliest way to drop one. The PowerStrap (\$37.50 from Chappell Computer Systems; 415/617-3750, 800/374-6723) is a full-length neoprene shoulder strap, suitable for medium distances; it shortens down to a handle for short distances. The \$89.95 PowerBook Kit from Qualtec (510/490-8911, 800/628-4413) contains a rigid short handle and includes a security cable and lock. Although it attaches the same way as the PowerStrap, the PowerBook Kit has one-way screws so it cannot be removed.

continues



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• Wraparound carrying cases

These fit the PowerBook like a glove and stay attached not only for carrying a PowerBook but also during computing. The \$59.95 PowerBook Wetsuit from Silicon Sports (415/327-7900, 800/243-2972) is the least expensive. The \$69 Wrap from Wrap Design (408/253-5378, 800/883-9727) features an optional \$95 Saddle Bag that goes over its handle to carry more accessories and papers.

• Slipcases

These simple pouches slip into a large briefcase or carrying bag. ComputerAid (508/674-0860, 800/343-3388) offers both padded (\$34.95) and unpadded (\$10.50) versions.

• Carrying cases

Many companies offer conventional cases with compartments for the PowerBook and accessories. Choosing one has become more of a fashion statement than a functional issue. I recommend staying away from cases with obvious computer logos; you may slightly reduce the risk of theft. I know of no one yet, however, offering the computer equivalent of tattered, prewashed jeans—a sturdy but scruffy case that few thieves would peg as valuable.

• Backpacks

For comfort on a long haul, you can't beat a backpack with a padded PowerBook pocket (\$40 to \$50) from ComputerAid or I/O Design (215/524-7277, 800/241-2122), or Utilitron's \$65 Power BackPack with extra pockets (818/883-4646, 800/428-8766).

Battling the Elements

If you ever use a PowerBook in hot or cold climates, you should follow a few simple guidelines. First, in nearly all common situations you needn't worry about your PowerBook. Second, if you plan to use a PowerBook at either temperature extreme, your best choice is a PowerBook with nickel-cadmium (NiCad) batteries (models 140 to 180). The next best option is a PowerBook 100 (lead acid batteries), followed by a Duo, which uses nickel-metal-hydride (NiMH) batteries.

There are actually two temperature ranges for PowerBooks—a range for operation and a range for shutdown or sleep mode. The PowerBooks' recommended temperature range for long-term storage (months) is the same as that for operation. However, Apple's guidelines for short-term storage vary for different models, depending on the type of battery they use (for specific temperature ranges, see "PowerBook Temperature Guidelines").

Surviving the Cold

The lowest temperature that Apple recommends for operating a PowerBook (50 degrees Fahrenheit/10 degrees Celsius)

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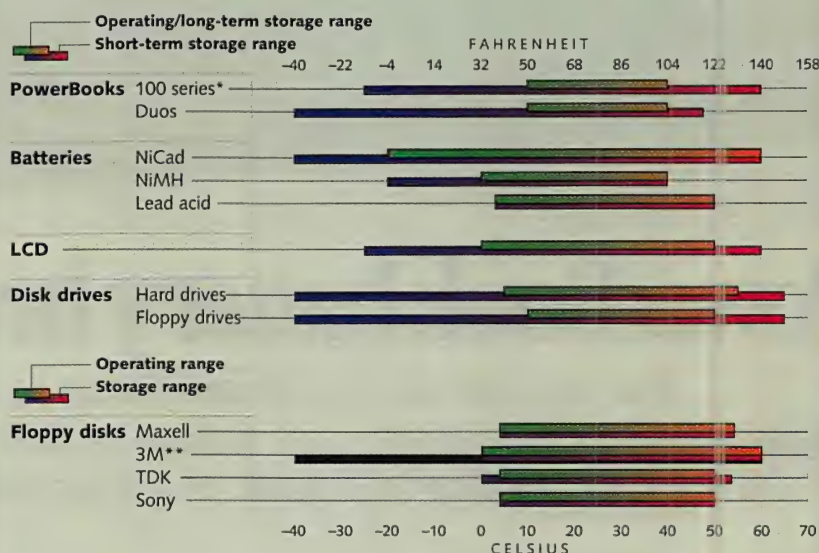


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PowerBook Temperature Guidelines

This graph shows vendors' recommended temperature ranges for operating and storing PowerBooks and major PowerBook components. In determining acceptable temperature ranges for PowerBooks, Apple had to consider the varying limits of the individual components—all manufactured by different vendors—that turned up during testing. As a result, some of the numbers may seem inconsistent. It's best to view these

temperature ranges as general, subjective guidelines rather than precise limits. For instance, Sanyo quotes a much more conservative short-term storage range for its nickel-metal-hydride (NiMH) batteries—used by the Duos—than Apple does for the Duos themselves. However, because Apple has thoroughly tested PowerBooks with all their built-in components, you can follow Apple's wider ranges.



Sources for temperature ranges: PowerBooks, Apple Computer; NiCad batteries, Saft; NiMH batteries, Sanyo; lead-acid batteries, Yuasa; LCD, Sharp; floppy drives, Sony; hard drives, Conner and Quantum. (See graph for floppy disk sources.)

*Some early manuals and specification sheets inaccurately listed the 100 series' short-term storage range as 50°F to 140°F/10°C to 60°C.

**The black bar indicates a range for short-term storage of less than a month, given only by 3M.

is set by the floppy disk drive, including the add-on drive for the Duos and PowerBook 100.

You can use a PowerBook at lower temperatures, as long as you don't use the floppy drive.

The operational limit is then usually determined by the hard drive. Although moisture inside the drive freezes at 32°F/0°C, the drive should recover at normal temperatures. If a computer is very cold, give it several hours to warm up to room temperature before operating it, because of condensation. Photographers often put cold camera equipment inside a watertight container before warming it up to room temperature so that condensation will not form on lens surfaces. This watertight step isn't necessary with computers, although it prevents condensation's forming within layers of the LCD. Such condensation causes no permanent damage and eventually evaporates.

Some people use computers with RAM disks at below freezing conditions—to monitor research apparatus, for example. They don't usually type on the keyboard but rather collect information


through a serial port or SCSI interface. Below freezing, an LCD screen slows down visibly, but it recovers at normal temperatures. At 32°F/0°C, a NiCad battery can deliver about 80 percent of its room temperature capacity; at -4°F/-20°C it delivers about 65 percent.

Floppy disk manufacturers say that their disks should not be used or stored at temperatures below 50°F/10°C (3M), 40°F/4°C (Sony, TDK), or 32°F/0°C (Maxell). 3M says its floppies will survive short-term storage in temperatures as cold as -40°F/-40°C. Floppies are best left behind if you venture into extreme temperatures.

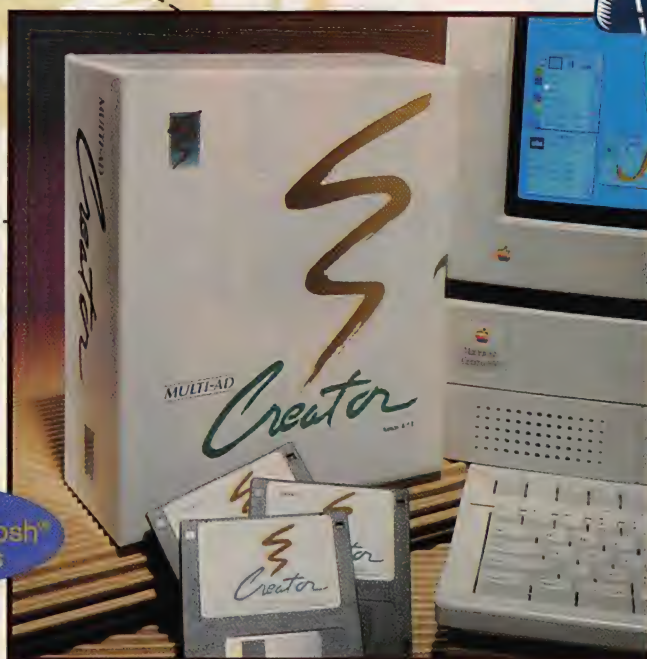
Beating the Heat

Most PowerBooks probably encounter heat more often than cold. Measurements made by the Armor All Products Corporation show that interior temperatures for a car parked in direct sunlight on a 105°F/40°C day can reach 180°F/82°C on a shaded floor, an astonishing 230°F/110°C on a sunlit seat, and 240°F/116°C on the dashboard and by the rear window.

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Although 180°F/82°C exceeds Apple's temperature guidelines, Apple says it knows of no PowerBooks subjected to such heat that were permanently damaged. Batteries lose some charge and might have a slightly shortened overall life, but they are not destroyed, not even a NiMH one. If you have to leave a PowerBook in a car, the trunk is obviously a safer place, for both temperature and security. If a PowerBook is exposed to temperatures higher than 200°F/93°C, it will suffer permanent damage, according to the component makers. LCD maker Sharp reports that the LCD screen will go through irreversible chemical changes when it approaches the boiling point. Several LCD makers, including Sharp, are developing temperature-resistant displays for car dashboards, but such displays are not used in computers thus far.

Although a PowerBook will apparently suffer no significant damage if shaded in a hot car, floppy disks won't fare so well. Floppy disk makers quote a maximum operational and storage temperature of 140°F, so leaving disks in a hot car is risky; the disk warps because the magnetic coating expands at a different rate than the plastic substrate does. Leaving floppies on a hot dashboard will destroy them.

Keeping It Dry

PowerBooks can withstand a wide range—at least 10 to 90 percent—of noncondensing humidity (which does not cause water to collect on surfaces).

Without some protection, a PowerBook is more vulnerable to splashed liquids than a desktop Mac. Whereas a spill on a desktop Mac is usually confined to the relatively inexpensive keyboard, a PowerBook's all-in-one-piece construction means that spilled liquids can quickly and easily reach all of its parts.

For those who must use a PowerBook near water, Wrap Design is developing a watertight, flexible plastic bag for PowerBooks that it expects to sell in the \$250 to \$300 range. Its waterproof zipper should protect the PowerBook from total immersion in shallow water. The wrapper will not permit use of the trackball, so pointing will depend on the cursor keys.

Some computer users in the tropics have encountered a fungus problem on floppy disks; the fungus looks like a fine white powder. 3M now has added a fungicide in the binder for the floppies that it sells in the tropics; distribution will expand worldwide in 1994. **m**

CARY LU is a Macworld contributing editor who covers mobile- and remote-computing issues in this monthly column. His books include *The Apple Macintosh Book* (Microsoft Press, 1992).

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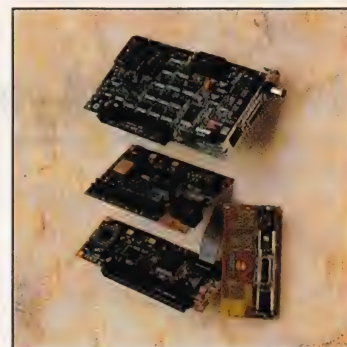
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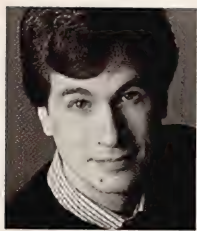
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My Mac Really Cooks

Culinary software for the rest of us

FOR AN SGSNM (SINGLE GUY, still not married), I consider myself fairly handy in the kitchen. I mean, I can pour milk onto almost any kind of cereal; I can microwave a Budget Gourmet with one hand; and when important company is coming over, I've been known to rustle up a pretty mean grilled cheese.

But my world was rocked the other night when I was taken to a very nice restaurant. Too nice, really. I gaped at the menu, rereading it, filled with creeping dread: I didn't know what *one thing was!* There was carpaccio, and daube de pied de porc, and beef oysters (don't ask). I realized at that moment that I, like one in seven Americans, may suffer from Culinary Impairment.

This is a treatable condition. I surrounded myself with the finest Mac products that pertain to cooking and recipe management. Because I can't judge a recipe by reading it, I invited Julia Pemberton, chef, food editor, and food consultant for shows like "CBS This Morning," to critique the culinary-quality quotient of my quarry.

By the way, I can already predict your natural reaction to the concept of recipe software: "How silly. Why not just buy a cookbook?" In theory, electronic cookbooks offer several advantages: (1) you can search them for specific recipes or ingredients; (2) the Mac can instantly adjust the amounts if you need to make, say, double or half portions; (3) most of these programs have a shopping-list feature that prints out a list of stuff to buy for the recipes you've selected; and (4) some of these programs actually attempt, via narration and on-screen videos, to *show you* how to make what you're making.

Digital Gourmet 2.6.2

Seems like this'd be just what the cooking doctor ordered: a clever, well-organized, electronic cookbook of 1000 recipes (\$49; Books-On-Disk, 617/734-9700). To view a recipe, double-click on its name. You can search for recipes by ingredient or title; add your own recipes; or (on a screen

apart from the recipe) multiply the amounts. Additional cookbooks of 500 recipes (specialties like African, Kosher, Drinks, and so on) cost \$49 each, or get the Deluxe edition with all 12 cookbooks for \$145. For the chef with a PowerBook on the counter, what could be better?

Well, the digital disappointments begin with the jarring wrong note in the melody of "Food, Glorious Food," which plays, unstopably, every time you launch the program. Not a program, really—a HyperCard stack. That means everything's in a small, primarily black-and-white window, and every little HyperTalk programming mistake results in a cryptic error message.

More to the point, however, the recipes in these stacks are a home-brewed, unedited, inconsistent hodgepodge. The emphasis seems to have been on quantity at any cost.



Do we really need *ten* blintz and knish recipes? The ingredients are listed in a run-on paragraph, and Julia says that the instructions, sometimes incomplete, often feel more like somebody's private notes than accurate directions for a chef.

Healthy Cooking CD Cookbook

Who better to bring a home-style chef's touch to software than *Better Homes & Gardens*?

You've gotta admit the concept is pure genius (\$59.95; Multicom Publish-

ing, 206/622-5530). Use the mega-mega-byte capacity of a CD-ROM disc to bring a successful cookbook to life. Illustrate every finished dish with a stunning, 24-bit, full-screen photo. Feature nearly 500 extremely tasty recipes with an emphasis on stuff that's good for you. Play some zesty music for each dish. And tie in a passel of QuickTime movies that illustrate cooking techniques for the novice.

I was prepared to be utterly ebullient about this disc until I discovered how slow it is. I mean *really* slow, painfully, unusably slow. It's not slow just because it's a CD-ROM; it's also based on HyperCard (even though it's a full-screen, full-color affair), which is—how shall I put this?—slow. Mushing from one nested screen to another is an exercise in agony, particularly when you wait 30 seconds to discover that you clicked on the wrong button and now

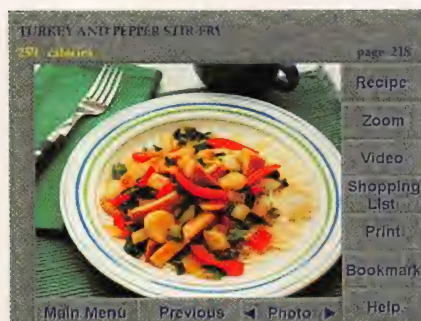
must spend 30 seconds getting back. There are other problems—you can only add all of your recipe's ingredients to the shopping list; the introduction section is navigationally messed up; the jaggedy fonts scream for Adobe Type Manager—but it's the speed that kills this one. But what a good idea!

Lilia's Kitchen, Vol. 1: Exotic Vegetables

Here's a more successful attempt to serve up some cooking on a silver platter (\$79.95; Electric Dreams, 714/753-9253). This CD-ROM goes *Better Homes &*

Gardens one better. Instead of seeing each dish, illustrated with a photo, you get a beautifully edited QuickTime movie of each dish being prepared from start to finish. It's a little bit like watching a cooking show on PBS, except that you have complete control over what dish the host prepares and when. This is what interactive CD-ROM was born to do. By imitating the grainy on-screen movie chef, even I could handle one of these dishes.

There are a couple of reasons why I *continues*



Better Homes and Dinners The nice thing about the Healthy Cooking CD Cookbook is the lush illustration of each dish. The unfortunate thing is that you can't see the recipe at the same time—it's on a different screen, nearly 30 seconds away.

might not do that. First, when Lilia says Exotic Vegetables, she *means* exotic. These recipes are, as Lilia admits in her preface, based on trendoid new L.A. fruit-stand fare: bittermelon, luffa, bottle gourd, and their ilk. Much of this stuff, I'm guessing, you won't find nestled among the Cheez-Whiz and Spam at your local Sav Mart.

Second, Lilia may be able to make major Yardlong Bean Bundles, but the woman can't spell worth—well, beans. She can't even handle the easy words (*avacado*, *bannana* [*sic*]), let alone the hard ones (*seperate*, *neighborhood*, *favorably* [*sic*, *sic*, *sic*!]).

One more thing: even the cavernous storage of a CD-ROM can only hold about 25 of those wonderful, long, and detailed QuickTime movies, so that's all the recipes you get. I take encouragement, however, from the "Vol. 1" in the disc's name. If Lilia ever puts together a sequel—perhaps a CD-ROM of normal recipes for normal people in normal cities—I'll be the first in line.

Two Shareware HyperCard Stacks

Rummaging on America Online, I discovered a couple of recipe and cooking-related stacks worth mentioning. First, there's From My Kitchen With Love, which, with its crude fonts, is hideous to look at (\$10 requested, Thomas Brown). But the hundreds of recipes, says Julia, are "much more professionally written than Digital Gourmet. The selection's like a church-supper cookbook: no particular theme, but everybody's old fail-safe standby is in there."

Cindy's Cookbook, on the other hand, has very few recipes—only 25—but the stack is absolutely charming and beautifully executed (free, Cindy Carney). Cindy's only into desserts—cookies, pies, cakes, and candies. (You can add your own, of course.) But with its friendly shopping-list feature and attractive design,

this stack should serve as a model for the commercial programs.

Mangia 1.0

Mangia (\$49.93; Upstill Software, 800/568-3696, 510/486-0761) is an absolute masterpiece, rich in details, depth, and humor. Its 350 recipes come mostly from the defunct but recently reincarnated *Cook's* magazine ("It was the classiest of the cooking magazines," says Julia). You can search for a recipe based on any criterion: its principal ingredients ("chicken and tomato sauce"); how much time you've got to fuss over the stove ("less than 20 minutes"); a food's ethnic origin; and so on. Almost instantly (this is the only program not based on HyperCard), a list appears.

A click on a recipe name reveals a capsule description ("Bauernfrühstück: A rustic omelet with potato, onion and bacon"). A double-click reveals the full recipe, gorgeously and logically displayed. Clearly marked is not just the cooking time but, more usefully, the *attention* time (after which you can go watch the news or something). Each dish is rated on sliding merit scales: Difficulty (from Foolproof to Tricky), Looks (Plain to Gorgeous), Kid Appeal (Yucky to Yummy), and so on.

The beautiful part is that you can switch, FileMaker-like, to alternate layouts of the same recipe using a pop-up menu. The Large Print view is ideal if you have to read your monitor from across the room while cooking. I'll bet you can figure out what the 4-by-6 Index Card layout is good for. There's also a different layout for each standard Mac screen size,

and even a design-your-own-layout mode.

The shopping-list feature in the other commercial cooking programs adds every ingredient in your selected recipes to the list. Mangia asterisks ingredients you probably already have (sugar, pepper, milk) and makes it simple to remove items you don't need to buy. Incredibly, when you print the list, the items are listed by *grocery-store department*, so you waste no time at the store.

You can customize, redesign, and tweak every conceivable aspect of the program; there may, in fact, be a couple too many features. Nonetheless, the manual, the recipes, and the software are all pleasing and polished to a shine.

The Upshot

Those CD-ROM discs show such promise! Too bad Lilia's videographers can't get together with *Better Homes & Gardens'* programmers. Until they do, I'd say the only cooking software that's worth the space on your hard drive is Mangia. Let me tell you, it's a joy. As the ultimate test, I actually used it to plan, shop for, and cook up a complete dinner. The Chicken with Smoked Mozzarella and Pesto was OK, but the Lemon Asparagus with Toasted Sesame Seeds and Spicy Broccoli Salad were awesome.

That leaves 347 recipes left to try before I make grilled cheese again. **m**

Contributing editor DAVID POGUE, having written *Macs for Dummies* and coauthored *Macintosh Secrets* (both IDG Books Worldwide, 1993), is making notes for a book called *How to Eat Foods You Can't Pronounce*.

ORGANIZING YOUR RECIPES

At the dawn of personal computing, when sages were predicting a computer in every home, the stereotypical scoff was, "Oh, sure. What's a housewife gonna do with a computer—organize her recipes?"

Well, yes, actually. Some software emphasizes organizing recipes rather than supplying them. For example, both Digital Gourmet and Mangia can serve as databases for recipes of your own.

Recipe Manager doesn't list any ingredients or cooking instructions (\$36.94; Truly Friendly Software, 303/674-5172). You're supposed to type in only references to recipes that you've got in magazines, books, drawers, whatever. When you need to whip up Rillettes du Lapin, Recipe Manager can tell you the magazine name, issue, and page number on which it appeared. Fortunately, you can also buy complete yearly indexes of the popular cooking magazines ready to go.

You gotta ask yourself, though, why it's necessary to buy any program. Why not use an actual database? Claris's FileMaker or ClarisWorks or ProVue's Panorama would do every bit as well as a canned recipe program.

If you don't even feel like laying out the fields of a customized FileMaker database yourself, then log on to America Online and grab Micro Cookbook II or GourMac. These are neat, nice FileMaker templates, shareware that provides attractive and functional recipe-management features (and comes with a few recipes already in place). I've posted them, as well as Cindy's Cookbook and From My Kitchen With Love, in the Macworld Online area.

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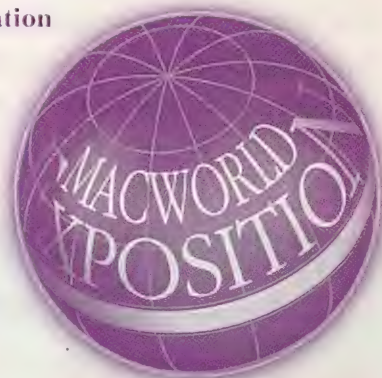
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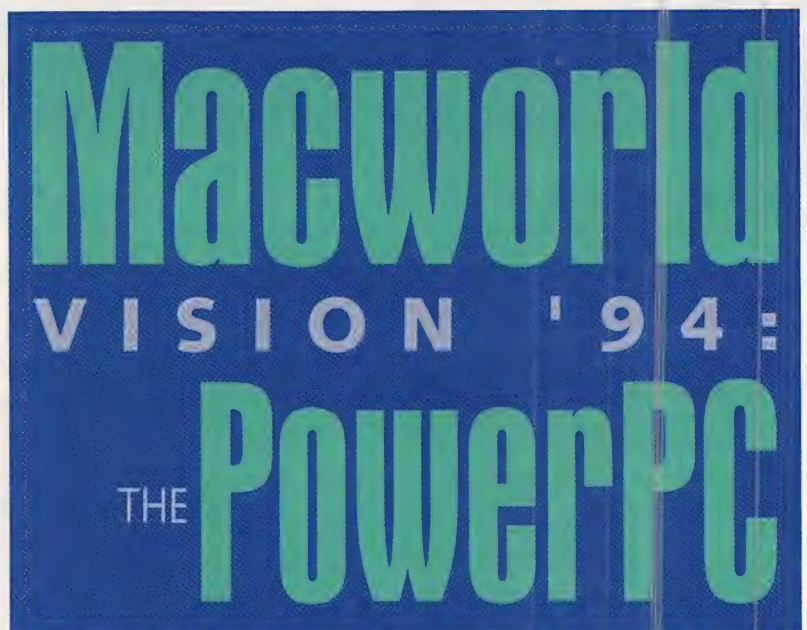
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Not Ready for Prime Time

Newton will be great—if it lives down its beginnings

FOR ALMOST A MONTH NOW I have been Newtonized, carrying about the sleek one-pound MessagePad that seems to have been dropped into our time from the future—something the Terminator mistakenly packed in his luggage. I have scribbled notes on it during an interview at a fancy hotel room, recorded a business contact's phone number during a transatlantic flight, and used it to schedule a play date for my three-year-old. It has gotten used to me, and I have gotten used to it. And after all this time, I am left not with a conclusion but a question—the Mystery of Newton, if you will: How can something so great be so useless?

Looking back on my experience, it was clear that trouble was afoot from the very start. The Newton MessagePad was officially introduced in early August, at Boston's Symphony Hall. John Sculley, Apple's dethroned king, proclaimed Newton "a product vision that will empower the rest of us." The event was designed to stir up a frenzy within the universe of gadget freaks and Macintosh Moonies, and that it did. The next day, lines were long at the few Macworld Expo booths trading in MessagePads. I stood in one line just to soak up the Zeitgeist. It was a partylike atmosphere, at least until someone was caught trying to cut in line, at which point the interloper was viciously pummeled by an outraged cadre of early adopters.

Yet even as the first few units went out the door, there were intimations of trouble. At the Newton rollout there were literally dozens of software and hardware developers showing demos of products that would work with the Newton—someday. The vapor was so thick you could have cut it with a knife. I rushed from booth to booth, attempting in vain to figure out just what it was that the basic product did. But it was difficult to get hold of an actual Newton for extensive testing. I figured that when I saw an advertisement for the Newton, all would be explained. But when I saw the ad, I was even more mystified. It was full of cryptic one-sentence paragraphs with a sort of

"Newton is you, Newton is me" message. It might have been written by the lyricist for Barney the Dinosaur.

Driver's Ed

Finally, I was granted a loaner unit. But by that time Apple was so paranoid about criticism that it was forcing electronic-ink-stained wretches like myself to submit to a 90-minute training session. The irony was delicious—here's a product supposedly easier to use than any personal computer, and Apple thinks that professional computer users shouldn't go near it without driver's ed!

The training, as it turned out, was helpful. The Newton is not trivial, and it presents an entirely new collection of tricks and icons. Although it does not take long to grasp the basics, I could see how

useful for applying makeup but makes it hard to read the otherwise sharp liquid crystal display), I found the system itself to be quite elegant. With almost no practice, I mastered the little taps you make on the screen that work like mouse-clicks on the Mac. With the Mac-like menus, it's simple to move from the default application—the notepad—to the other two main built-in functions, the scheduler and the name list. All in all, I appreciated the talent and virtuosity that went into the operating system.

And then there was the handwriting recognition. To be honest, I didn't expect much. My scrawl is so illegible that I often can't make it out. Yet to my surprise, the Newton did a credible job of deciphering most of my words. It was clear that Apple had performed a job of serious wizardry by producing some state-of-the-art handwriting recognition in such a small package. So I won't mock its efforts by adding to the cheap shots proliferating in the media about the weird interpretations the Newton is likely to make of one's words. (Okay, *one* cheap shot. When I began to write, "These are the times that try men's souls" the Newton printed "What Arute Odd Carolyn 4.")

The Newton is a case where the best available is not good enough. You may recall Samuel Johnson's comment concern-

ing a dog walking on its hind legs. "It is not done well," said he, "but you are surprised to find it done at all." As soon as my training session was over, I spent several hours playing with the MessagePad, marveling at how wonderful it was—the dog could dance! Then I took it out in the real world. And it was like Dr. Johnson's dog auditioning for the Bolshoi Ballet.

Typical instance: I meet someone who wants to give me his phone number.

continues



a Newton MessagePad owner not inclined to read manuals might not figure out for days that, for example, holding the pen down at the beginning of the word generates something that looks like an ink-blot, and if you extend the blot over the word, you have "selected" it, and can drag it somewhere else on the notepad.

It was during this session that I realized how nifty the Newton really is. Though I never did get accustomed to the annoying screen glare (which might be

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"Don't give me a card!" I say—"I've got this!" I whip out my Newton. I tap the screen on the proper icon to access the Names section, then try to write the name. I miss by a single letter, which on the Newton is the worst thing you can do. Attempting to correct it often results in the Newton's misreading the correction as a new letter. Then I attempt to "scrub" the two wrong letters and the Newton reads my scrub as a new shape. I finally scrub the whole word—resulting in the satisfying puff of smoke that signifies deletion—and start over. And my new friend is looking at me with something akin to pity.

Okay, so you can't really use the Newton to write on the fly. But what you can do is turn off the handwriting recognition and use so-called digital ink to record your actual scrawl. So I took the MessagePad along to an interview in lieu of a real notepad. I began recording my source's quotations and all was well—for about three minutes. Then the Newton clammed up on me. After a brief pause, a message came up on the screen: "The note could not be changed. (The note has too many items. Start a new note by drawing a horizontal line across the notepad.)"

So I drew a horizontal line to start a new note, one of the Newton's less reliable tricks. I frantically tried three times to begin a new entry. Meanwhile, my source, oblivious to this crisis of notation, babbled on. Finally I opened up a new note, and resumed my transcribing. But just when I had begun to catch up with what my source was saying, the same thing happened. So much for digital ink.

These experiences were typical, and after about a dozen of them, I had things figured out. The more I played with the Newton, the more I liked it. But the more I attempted to *work* with the Newton, the more frustrated I got. Whenever I got something right the first time, I felt exultant—like I had caught a touchdown pass. But when you use something every day, you expect things to work more often than not. The successful entry of a lunch date shouldn't be as much of an event as playing in the Rose Bowl. But such triumphs, especially when one writes at a normal pace, are just as rare. Toward the end of my loan period, I had to force myself to use the thing. The novelty had worn off. It was clear that my scheduling, note taking, and name filing could better be performed by a combination of the PowerBook and paper scraps.

Newton's Prospects

Judging from what has been announced and not yet shipped for the MessagePad,

I think the Newton has a potentially wonderful future. My road test came too early to use the built-in electronic mail or the wireless paging. Both of those, by turning the Newton into a receiving station for mail and telephone messages, will make the device much more useful. And there are any number of announced third-party applications that will dramatically increase the utility of Newtons. One in particular looks so impressive that it might force me to buy a MessagePad—a baseball statistics package that works with a pager to keep you informed of home runs, stolen bases, and games won *in real time*.

The Newton deserves its chance to evolve and shine. But it now faces a huge obstacle: Apple's premature, overhyped release. Every person who, like me, tested a Newton within a month or two after its release, glimpsed only potential—and some of us became soured on its ability to actually perform real work. As a result, a truly innovative product is now saddled with a tarnished reputation.

Apple's spin doctors, aware of the limitations of the MessagePad upon its release, often invoke the example of the 128K Macintosh, another groundbreaking product that in its early days fulfilled only a fraction of its promises. "We've learned our lesson," say the Apple people, pointing to the new applications and add-ons that will soon come online for the Newton. They imply that the mistake made with the early Mac was allowing too much time to pass before reinforcements arrived. But the real mistake was releasing an underpowered, unsupported machine at all. In both of these cases, just because the development process was lengthy and potential competition loomed, Apple shoved the units out the door too quickly. In the case of the Macintosh, this haste was almost fatal—it took years before people regarded the computer as anything but a toy.

Likewise, Apple should never have released the Newton in its present form. The company should have released Newton MessagePads when they were ready, with built-in modems and twice as much memory, for the lowest price manageable—\$300 is about right, with the price going down to \$200 when volume gets ramped up.

Apple should have delivered something dazzling enough to establish the Newton as the standard for PDAs. If Apple had waited, the MessagePad could have changed the world. It still might. But first, it has to do something useful. **m**

STEVEN LEVY's new book, *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything*, will be published by Viking in January.



Behind Mail-Order Complaints

Readers laud favorite companies—and bemoan shipping delays

FOR SEVERAL YEARS, *MACworld* has forwarded reader complaints shared with this column to Macintosh-related companies. The idea behind this service is that most companies are staffed by well-meaning and hardworking folks who want their customers to be satisfied. Despite good intentions, particular problems or issues sometimes fall through the cracks. By forwarding these complaints, *Macworld* gives companies another opportunity to win—or win back—loyal customers.

Mind you, companies don't always agree that the complaints are valid—and sometimes they're not. When they are, vendors often respond favorably and work out solutions that satisfy their customers. If a company's policies or service seem particularly egregious, I may write about them in my annual *Saints and Sinners* column (coming up next month) or in another column during the year. It's not a bad system overall, but it's difficult for *Macworld* to track the resolution of every single complaint, because companies and readers often fail to update us on the situation. But knowing the outcome of complaints is important—particularly when it involves mail order, since it's usually impossible to go to a mail-order business directly to deal with problems.

Last month I offered advice on buying by mail. This month, I want to briefly delve into our database to give you a glimpse behind the complaints we receive. *Macworld* attempted to interview all readers who sent complaints to this column between May 1992 and July 1993. We were able to reach 87 of 155 people. Two *Macworld* staffers tackled the phones to ask readers three simple questions: Are you satisfied with the company's response to your complaint? Would you buy from this company again? What mail-order companies would you recommend?

The survey involved 36 companies, 9 of which are no longer in business. Most

of the companies were represented by an interview with 1 or 2 customers. Because of the small sample, in "Mail-Order Feedback: Service and Support," we list only companies for which we were able to interview at least 3 people, but we considered information from all 87 customers when it came time to determine readers' favorite companies and the overall nature of complaints.

Reader Feedback

This survey offers a window into how well or badly some companies deal with customers who have persistent problems. And the results suggest that some mail-

On the other hand, all 3 people who write with complaints about MacDirect would buy there again. Of the 7 customers who complained about MacProducts, 2 said the complaint was resolved satisfactorily, and 3 said they would continue to buy from the company. Of the 7 consumers who complained about TigerDirect Software Mall, 3 said they were satisfied with the resolution; 2 would use TigerDirect again.

More interesting than the total number of complaints was their nature. By far the majority involved delays—in receiving product orders, repairs or replacement products, and refunds or credits.

Next on the list was receiving a wrong or defective product. Readers also complained about misinformation (higher prices than expected, for example) and unreturned phone calls, but those complaints were less common.

When we asked readers what mail-order companies they would recommend, the three largest Macintosh mail-order companies topped the list. MacConnection led with 36 mentions; MacWarehouse was next with 31 votes; The Mac Zone followed with 24 mentions; and Mac's Place was a distant fourth with 8

votes. (Other candidates received many fewer mentions.)

Defining the Survey

It's important to understand what this survey doesn't measure. It doesn't show how many customers are satisfied with the service they have received from the companies listed, for example. To put it in context, only 155 people wrote to me with complaints about mail-order and direct-sales companies during the period covered



order companies have not been very responsive to customer concerns. Of the 87 readers that *Macworld* polled, roughly ¼—22—were satisfied with the resolution. And a mere 12 of the 87 would buy again from the same mail-order company.

Several companies laid goose eggs in the loyal-customer category. Not one of the surveyed customers of Computer Design and Graphic Systems, MacCenter, MacDepot (now MacMall), or Mac Sale International said he or she was willing to buy from those companies again.



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Mail-Order Feedback: Service and Support

Company	Customers	Satisfied	Would Buy Again	Nature of Complaints
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MacCenter	14	3	0	A, C, D, E
MacDepot (now MacMall)	3	0	0	C, D
MacDirect	3	1	3	A, D, F
MacProducts USA	7	2	3	A, B, C, D
Mac Sale International	4	1	0	B, D, E
TigerDirect Software Mall	7	3	2	A, C, D, E, F
Other companies	44	11	4	A, B, C, D, E, F
Total	87	22	12	

A = Delays in shipping products. B = Delays in repairs or replacement. C = Delays in refunds or credits. D = Received incorrect or defective products. E = Customer felt misinformed about order or process. F = Customer felt company wasn't responsive to calls or letters.

What's the level of customer satisfaction with mail-order companies? Fairly high, based on the number of complaints *Macworld* receives. Fairly low among those few readers who write us about problems. The numbers above are based on interviews with 87 readers who wrote us with complaints about 36 companies between May 1992 and July 1993. We include only service-related complaints, and only for companies for which we were able to interview 3 or more customers. Our goal was not a statistically valid survey but an overview of the responsiveness of mail-order companies to customers with persistent problems. Finally, the level of customer service these companies offer may have changed since the survey was conducted.

by the survey—that's out of a circulation of 500,000 readers. No doubt more than 155 people in all the world were cranky about mail-order issues during that time, but the low number of written complaints suggests that most companies provide good service and support.

Moreover, the survey doesn't show how many consumer complaints were resolved without the magazine's involve-

ment. Readers usually don't write to *Macworld* unless they feel ignored, so the survey generally represents people who said they had already attempted to resolve their problems directly with the vendors. I should also mention that *Macworld* hasn't confirmed the facts of the complaints; some may be unreasonable.

Finally, note that the circumstances that led some customers to be negative about these companies may have changed since the survey took place. For example, MacCenter president John Stratton says his company's customer-service problems were created by understaffing and are now a thing of the past, thanks to more and better-trained employees.

A Friendly Challenge

Given the few complaints I receive, it seems clear that the mail-order industry keeps most of its customers happy. But the survey also suggests that some companies could do more to help customers with persistent problems. Can mail-order companies improve their records? I'm betting they can—check in next year for an update. Meanwhile, happy shopping, and remember to protect yourself by using a credit card when you buy via mail. **m**

Research assistance by JOANNA PEARLSTEIN and GIDEON YAFFE.

Send nominees for sainthood to *Service Heroes*, *Macworld*, 501 Second St., San Francisco, CA 94107; or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

SERVICE HERO

Donald C. Lyles of Rockville, Maryland, writes to praise Connectix. During Macworld Expo Boston last August, Lyles complained that Connectix's CPU showed only six minutes of power remaining, although his PowerBook 100 battery was fully charged. No one had an explanation, but Alexander Louie, a Connectix rep who was at the session, promised to look into it. About two weeks later, Lyles got a call from Louie, who said the problem was probably due to a damaged preference file and suggested opening a new user file. A complimentary upgrade to CPU 2.0 arrived the next week. "I must rate not only the product as being of commendable quality, but the customer service as displayed by Mr. Louie as being first-class," writes Lyles.



Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld's* comparative articles through the past year. A ♦ next to a product indicates that we chose more than one product in that category.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93

Portrait monitor: 15-Inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; \$399, with video-display board \$549.

Two-page monitor: ♦ L-View MultiMode; Sigma Designs, 510/770-0100; \$1099, with video-display board \$1398. ♦ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; \$699, with video-display board \$798.

COLOR MONITORS, Oct 93

16- and 17-inch: ♦ ErgoView 17; Sigma Designs, 510/770-0100; \$1349.

♦ MultiSync 5FG; NEC Technologies, 708/860-9500; \$1355 (NEC's estimated dealer price).

GRAY-SCALE MONITORS, May 93

Portrait monitor: Pivot Display; Radius, 408/434-1010; \$849, with video-display board \$1148.

Two-page monitor: MultiMode 120, SilverView Pro; Sigma Designs, 510/770-0100; \$1099, with video-display board \$1299.

SMALL COLOR MONITORS, Jan 94

14-inch display: ♦ Sony CPD 1430; Sony Corp. of America 800/222-7669; \$779.95. ♦ Nanao FlexScan F340i*W; Nanao USA, 800/800-5202; \$899.

15-inch display: NEC MultiSync 4FG; NEC Technologies, 708/860-9500; estimated street price \$755.

NETWORK HARDWARE

HARDWARE ROUTERS, Jul 93

Under \$1500: EtherRoute; Compatible Systems, 303/444-9532; base model \$1495 (no TCP/IP support).

Between \$1500 and \$3500: InterRoute/5; Farallon Computing, 510/814-5000; \$3299 to \$3499.

HIGH-SPEED FAX MODEMS, Oct 93

Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold \$499, Silver \$429.

POWERBOOK TOOLS

DUO DOCKING CONNECTORS, Feb 93

PowerLink DeskNet; E-Machines, 503/646-6699; \$699.

EXTERNAL HARD DRIVES, Feb 93

♦ Companion 120; APS Technologies, 800/874-1428; \$599. ♦ PocketDrive 120MB; La Cie, 503/520-9000; \$699.

INTERNAL FAX MODEMS, Feb 93

♦ PowerModem series; PSI, 408/559-8544; \$195 to \$495. ♦ PowerPort series; Global Village Communication, 415/390-8200; \$229 to \$499.

SCSI MONOCHROME MONITORS, Feb 93

Power Portrait; Sigma Designs, 510/770-0100; \$749.

PRINTERS

COLOR PRINTERS, May 93

Dye-sublimation: ♦ ColorStream/DS; Mitsubishi International, 408/980-1100; \$9950. ♦ Phaser IISD Color Printer; Tektronix, 503/682-7377; \$9995.

Thermal-wax: ♦ ColorScript 210; QMS, 205/633-4300; \$4995. ♦ Personal ColorPoint PSE; Seiko Instruments, 408/922-5800; \$2999.

Low-end liquid-ink: HP DeskWriter 550C; Hewlett-Packard, 800/752-0900; \$1099.

Midrange liquid-ink: HP PaintJet XL300; Hewlett-Packard, 800/752-0900; \$3495.

Solid-ink: Phaser III PXi Color Printer; Tektronix, 503/685-3585; \$9995.

PERSONAL PRINTERS, Sep 93

Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; \$359.

PostScript laser: TI microLaser Series; Texas Instruments, 512/250-6679; \$1199 to \$1599.

QuickDraw laser: LaserWriter Select 300; Apple Computer, 408/996-1010; \$839.

WORKGROUP PRINTERS, Jan 93

Basic printing: microLaser XL Turbo; Texas Instruments, 512/250-6679; \$3649.

High-speed office printing: Pagemarq 20; Compaq Computer Corp., 713/370-0670; \$5699.

Duplex printing: LaserJet IIISi; Hewlett-Packard, 800/752-0900; \$6995.

SCANNERS

LOW-COST COLOR SCANNERS, Nov 93

\$1300 to \$1600: ♦ La Cie Silverscanner II; La Cie, 503/520-9000; \$1599. ♦ Hewlett-Packard ScanJet IIc; Hewlett-

Packard, 800/752-0900; \$1599.

Under \$1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; \$1299.

OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; \$995.

SYSTEMS/STORAGE

DOUBLE-SPEED CD-ROM DRIVES, Jul 93

Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; \$1795.

Overall value: AppleCD 300; Apple Computer, 408/996-1010; \$599.

Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; \$465.

HIGH-SPEED HARD DRIVES, Aug 93

1GB drives: ♦ Edge 1000r; Saturae, 617/661-8166; \$1499. ♦ MiniPak 1000; Optima Technology, 714/476-0515; \$1995.

2.7GB drives: ♦ Nova XL 2700; Microtech International, 203/468-6223; \$2999. ♦ Vista 3.5GB; Relax Technology, 510/471-6112; \$3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; \$499.

MACINTOSH UPGRADES, Jun 93

Classic accelerator (40MHz): TransWarp Classic; Applied Engineering, 214/241-6060; \$798 (with FPU).

SE accelerator (50MHz): Gemini Integra; Total Systems, 503/345-7395; \$1089 (with FPU).

SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; \$449 (without FPU).

SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz \$999 (with FPU), 33MHz \$449 (without FPU).

LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; \$599.

Mac II accelerators: ♦ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i \$1199, 33 \$2499. ♦ Universal PowerCache series; DayStar Digital, 404/967-2077; \$449 to \$999.

IIx SCSI accelerator: QuickSCSI; PLI, 800/288-8754; \$499.

Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; \$299 for Quadra 700 and 900, \$449 for Quadra 800 and 950.

MIDRANGE HARD DRIVES, Mar 93

Low-capacity drive: La Cie Cirrus 240; La Cie, 503/520-9000; \$769.

Notable technology: DiamondDrive 510; Mass Microsystems, 408/522-1200; \$2089.

continues

Editors' Choice

Bargain: APS Fujitsu 520; APS Technologies, 800/874-1428; \$1149.

All-around quality: hammer 525FMF; FWB, 415/474-8055; \$2799.

OPTICAL DRIVES, Dec 93

3½-inch: ♦ Epson OMD 5010; ClubMac, 800/258-2622; \$959. ♦ 128 MO; APS Technologies, 800/874-1428; \$899.

5¼-inch: ♦ Sharp JY-750; ClubMac, 800/258-2622; \$1829. ♦ Infinity MaxOptical 11m; PLI, 800/288-8754; \$4113.

VIDEO/DISPLAY

24-BIT COLOR GRAPHICS BOARD, Feb 93

♦ Spectrum/24 PDQ Plus; SuperMac Technology, 408/541-6100; \$1999. ♦ Thunder/24; SuperMac Technology, 408/541-6100; \$2999.

COLOR LCD PROJECTION, Jan 93

Display panel: MediaPro; nView Corp., 804/873-1354; \$7995.

Low-end panel: TFT Rainbow HD Model 700; Chisolm, 408/559-1111; \$5295.

Complete LCD projector: System 6000; In Focus Systems, 503/692-4968; \$8495.

VIDEO-CAPTURE BOARD, Jan 93

VideoSpigot; SuperMac Technology, 408/541-6100; \$449 to \$1399, depending on bundling options.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93

Small-business system: M.Y.O.B.; Teleware, 201/586-2200; \$199.

Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; \$119.95.

PERSONAL FINANCE, Jun 93

♦ CheckWriter 4.0; Aatrix Software, 701/746-6801; \$79. ♦ Andrew Tobias' Managing Your Money 5.0; MECA Software, 203/256-5000; \$79.95.

BUSINESS TOOLS

STATISTICS, Oct 93

Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; \$595.

Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; \$895.

COMMUNICATIONS/NETWORKS

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93

Faxstf; Telefocus, 816/886-9800; \$79.

NETWORK CONNECTIVITY, Sep 93

NetWare for Macintosh; Novell, 801/429-7000; \$495 for 5-user license to \$2295 for 200-user license.

NETWORK DIAGNOSTICS, Feb 93

Ethernet: EtherPeek; AG Group, 510/937-7900; \$795.

LocalTalk: LocalPeek; AG Group, 510/937-7900; \$495.

NETWORK MANAGEMENT, Feb 93

Network SuperVisor; CSG Technologies, 412/471-7170; \$495.

SOFTWARE ROUTER, Jul 93

Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package \$499.

TERMINAL EMULATOR, Oct 93

VersaTerm; Synergy Software, 215/779-0522; \$149.

GRAPHICS

2-D CAD, Jan 93

Low-end: Blueprint; Graphsoft, 410/461-9488; \$295.

Midrange: PowerDraw; Engineered Software, 919/299-4843; \$795.

3-D DESIGN, Aug 93

Price for performance: ♦ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; \$299. ♦ Alias Sketch 1.5; Alias Research, 416/362-9181; \$995.

All-in-one solution: ♦ Infini-D 2.5; Specular International, 413/549-7600; \$995. ♦ StrataVision 3D 2.6.1; Strata, 801/628-5218; \$995.

CLIP ART'S GREATEST HITS, Jan 94

Overall collection: ♦ ClickArt Studio Series; T/Maker Company, 415/962-0195; \$99.95 per volume. ♦ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; \$67.50 per month. ♦ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; \$74.95 per volume, CD-ROM \$149.95. ♦ Images with Impact series; 3G Graphics, 800/456-0234; \$99.95 to \$129.95 per volume, CD-ROM \$499. ♦ Typographers' Ornaments; Underground Grammarian, 609/589-6477; \$25 per volume; ten TIFF albums \$200; EPS volumes \$50 each.

DRAWING PROGRAMS (LOW-COST), Sep 93

Budget draw: Expert Draw; Expert Software, 305/567-9990; \$49.95.

Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; \$79.

Beginners' program: Aldus SuperPaint; Aldus Corp., 619/558-6000; \$149.95.

Overall: Canvas; Deneba Software, 305/596-5644; \$399.

IMAGE DATABASES, Oct 93

♦ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; \$295.

Vendors: Please write to Macworld Editors' Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

♦ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; \$249.

PAINT AND IMAGE-EDITING, Sep 93

Budget buy: Expert Color Paint; Expert Software, 305/567-9990; \$49.95.

Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; \$399.

Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; \$895.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93

Alarm system: ♦ First Things First; Visionary Software, 503/246-6200; \$79.95. ♦ Smart Alarms Plus; JAM Software, 203/630-0055; \$75.

All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; \$99.

Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack \$495.

PERSONAL INFORMATION MANAGEMENT, Feb 93

TouchBase/DateBook; After Hours Software, 818/780-2220; \$169.95.

SALES-AUTOMATION SOFTWARE, Oct 93

♦ Contact Ease; WestWare, 619/660-0356; one user \$395, five users \$1495. ♦ CBS; Colleague Business Software, 512/345-9964; \$495.

TEXT-RETRIEVAL SOFTWARE, Dec 93

Small system: On Location; On Technology, 617/374-1400; \$129.

Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; \$995.

PRESENTATION TOOLS

MULTIMEDIA AUTHORING, Mar 93

Entry-level: ♦ Action; Macromedia, 415/252-2000; \$495.

♦ Passport Producer; Passport Designs, 415/726-0280; \$495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94

Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; \$189.95.

Book-length documents: FrameReader; Frame Technology, 800/843-7263; \$84.95

PRINTING, Sep 93

PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; \$149.

SECURITY, Feb 93

File encryption and erasure: Citadel with Shredder; Datawatch Corp., 919/549-0711; \$99.95.

Full-featured security: ultraSecure; usrEZ Software, 714/756-5140; \$239.

Low-cost security: PassProof; Kensington Microware, 415/572-2700; \$64.95. **m**

Star Ratings

OVER 350 HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of hundreds of *Macworld's* authoritative product reviews. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★★ **4D Server 1.0.1, ACI US, 408/252-4444, \$1495 to \$3495.** Database server uses the ingenious multitasking technology built into 4D to make it appear that each client has the full resources of the server. If you use 4D on a network, you need this product. Jun 93

★★★★ **4th Dimension 3.0.1, ACI US, 408/252-4444, \$895.** Multitasking, which greatly improves speed, makes this upgraded relational database delightful for both developers and end users. For a relational database, it's impressively easy to use. Apr 93

★★ **AccuZip6 1.5.2, Software Publishers, 714/846-1908, \$899.** Professional-level mail-list management tool on CD-ROM is the most comprehensive system available, but its inexcusable user-interface violations make our reviewer reluctant to recommend it. May 93

★★★★ **Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, \$195 to \$2495.** Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★★ **@Risk 1.1, Palisade Corp., 607/277-8000, \$395.** Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★★★ **ClarisWorks 2.0, Claris Corp., 408/727-8227, \$299.** Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

★★★★ **Common Ground 1.0, No Hands Software, 415/321-7340, \$189.95.** Simple, robust document interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★ **EasyFlow 1.1, HavenTree Software, 613/544-6035, \$229.** The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93

★★★★ **FileMaker Pro 2.0, Claris Corp., 408/727-8227, \$399.** Easier scripting, improved mailing labels and text-handling, and support for QuickTime and Apple events are the major new features of this upgraded, multiuser, flat-file database. Although it has some minor bugs, this is a strong upgrade to an excellent program. Jan 93

★★★★ **FlowChart Express 1.0 (1.01), Kaetron Software Corp., 713/890-3434, \$149.** Inexpensive, easy-to-use flowchart software meets the needs of most flowchart creators, although those with extensive requirements will need a larger, more powerful feature set. Jan 93

★★★★ **Helix Express 1.0, Helix Technologies, 708/205-1669, \$439.** This relational database has an iconic programming language that sometimes baffles programmers, but provides an easy route into basic data-handling for nonprogrammers. Jul 93

★★★★ **Helix Tracker 1.0, Helix Technologies, 708/465-0242, \$439.** Well-designed workgroup-document manager has strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★★★ **ithink 2.2.1, High Performance Systems, 603/643-9636, \$695.** Although it requires a real training commitment for effective use, this product is an attractive dynamic business modeling system. It's a good bet for identifying cloudy spots in the crystal ball. May 93

★★ **Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, \$495 per client.** Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★★ **MacBarcode 2.24, ComputaLabel, 508/462-0993, \$349 to \$895.** Simple-to-use desk accessory creates bar codes in EPS or Adobe Illustrator 1.1 format. DA cannot automatically create serial codes. Jun 93

★★★★ **MacProject Pro, Claris Corp., 408/727-8227, \$599.** If you're working on a midsize project and like using PERT charts, this may be the project-management software for you. However, the multistep scheduling process and the limited integration between charts are frustrating if you prefer Gantt charts. May 93

★★★★ **MarcoPolo 2.0, Mainstay, 805/484-9400, \$395.** Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents,

whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★★ **Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, \$595.** Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

★★ **Memorizer 2.0, Brains Software Engineering, 432-231-28973 (Austria), \$100.** Software records dictation and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appetite, and its propensity to crash. Aug 93

★★★★ **Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, \$695.** When you require cross-project resource sharing and leveling, for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

★★★★ **Microsoft Project 3.0, Microsoft, 206/882-8080, \$695.** An amazing range of functions, including new scheduling and formatting, are packed into this project-management software. The improved tool bar helps novices schedule tasks with push-button ease. Jan 93

★★★★ **Microsoft Works 3.0, Microsoft, 206/882-8088, \$249.** Capable upgrade delivers marginally improved functionality and a welcome face-lift to this integrated program, but there are a number of incompatibilities, odd design choices, and performance flaws. Feb 93

★★★★ **Office Tracker 1.1, Milum Corp., 512/327-2255, \$195 to \$995.** The efficient user interface of this software sign-out board, in both single-user and networkable versions, makes it easy to learn and use, but it has some minor flaws such as not allowing customizable sorts. Dec 93

★★★★ **OrgChart Express 1.0, Kaetron Software, 713/890-3434, \$279.** Organization-chart software links a database to standard box-drawing functions. Although the learning curve is steep, the effort may be worth it for people who regularly work with large or complex organization charts. Apr 93

★★★★ **Project Scheduler 5, Scitor Corp., 415/570-7700, \$695.** For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

★★★★ **SpreadBase 1.0.1, Objective Software, 415/306-7410, \$695.** Business data-analysis tool is a unique combination of database and spreadsheet functions. It's worth a close look for power users, despite meager documentation. *continues*

Star Ratings

mentation and a cranky macro language. **May 93**

★★ **Useful Voice Processor for Macintosh 1.1v7**, Useful Software Corp., 508/774-8233, \$179.95. Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. **Dec 93**

★★★ **Wingz 1.1ae**, Informix Software, 913/599-7100, \$399. Low-overhead spreadsheet offers advanced-math functionality, a competent calculating engine, and superior charts; but is missing outlining, real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. **Jul 93**

★★★ **WordPerfect Works 1.2**, WordPerfect Corp., 801/225-5000, \$249. This program offers seven well-integrated and flexible modules. It has a few shortcomings, including some memory-management problems, but buyers should generally be pleased. **Jun 93**

COMMUNICATIONS/NETWORKS

★★★★ **MicroPhone Pro**, Software Ventures Corp., 510/644-3232, \$295. Truly comprehensive telecommunications package now includes send-and-receive fax software. Although the new TCP/IP tools are complicated, the documentation is clear and precise. **Apr 93**

★★ **NetVirtual 2.0**, Eclectec, 408/462-2040, \$995 to \$4985. One-of-a-kind network-simulation product favors flexibility at the expense of usability. Only after hours of work will your simulation report anything meaningful about your network, and even then the results are difficult to analyze. **Apr 93**

★★★ **Network Vital Signs 1.0 (1.1)**, Dayna Communications, 801/531-0600, \$449. Fault-monitoring application continually watches selected network devices, monitoring for specific errors. Unfortunately, when monitoring more than ten devices, it noticeably degrades the performance of the monitoring Mac. **Mar 93**

★★★ **On the Air 1.0.1**, Digital Eclipse Software, 510/547-6101, \$79.99 to \$639.99. Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. **Aug 93**

★★★ **On The Road 1.1**, Connectix, 415/571-7100, \$99. Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports some hardware, however, so check before buying. **Dec 93**

★★ **SoftPC with Windows**, Insignia Solutions, 415/694-7600, \$499. The emulation of a complete and accurate Windows environment on a Mac is an amazing accomplishment, but the product is so slow, even on a Quadra, that it performs in what might best be characterized as a dreamlike languor. **Jun 93**

★★★★ **Timbuktu 5.0.1**, Farallon Computing, 510/814-5000, \$199 to \$5500. By letting one computer (a Mac or a Windows-based PC) control, observe, or exchange data with another computer, this terminal-emulation product allows you to use resources almost anywhere on a network. **Mar 93**

DESKTOP PUBLISHING

★★★★ **Aldus Fetch 1.0**, Aldus Corp., 206/622-5500, \$295. The rich feature set and network sup-

port of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. **Aug 93**

★★★★ **Aldus PageMaker 5.0**, Aldus Corp., 206/622-5500, \$895. Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. **Nov 93**

★★ **Aldus Personal Press 2.0**, Aldus Corp., 206/628-2320, \$199. Basic, inexpensive page-layout program gains strength, but is still missing elements that novice users need, such as automatic kerning. Its software-knows-best approach to copyfitting makes manual fine-tuning difficult and is likely to confuse beginners. **Mar 93**

★★★★ **Apple Font Pack**, Apple Computer, 408/996-1010, \$99. Apple's first collection of TrueType fonts includes only 12 fonts that haven't been available since the late eighties in the PostScript format. Still, it's not a bad deal, considering that Adobe PostScript fonts cost four times as much. **Mar 93**

★★★ **Cumulus 1.1**, Canto Software, 415/431-6871, \$295. Good network support, plus a feature that creates a protocol file for recording user actions, make this image-cataloging program a good choice for workgroups. It doesn't have an image preview feature, or offer 32-bit thumbnails. **Aug 93**

★★★ **Expanded Book Toolkit 1.0.1**, The Voyager Company, 310/451-1383, \$295. Using this hypermedia publishing program, average mortals can create highly functional multimedia books in a fraction of the time it would take to do the job unassisted. Be aware, though, that it's no QuarkXPress. **Jun 93**

★★★★ **FontMonger 1.5.7 (1.5.9)**, Ares Software Corp., 415/578-9090, \$149.95. Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create composite, subscript, superscript, and rotated characters. **Sep 93**

★★ **ImageAccess 1.0**, Nikon, 516/547-4355, \$495. This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. **Aug 93**

★★★ **Kodak ColorSense 1.0**, Eastman Kodak, 716/253-0740, \$499. Color-management system gives average users access to reasonable level consistency at a reasonable price. It does not make color separations. **Oct 93**

★★ **Kudo Image Browser 1.0**, Imspace Systems Corp., 619/272-2600, \$295. This image-cataloging software cannot control thumbnail depth or compression, and doesn't have a keyword feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. **Aug 93**

★★★ **Lazy Dog Foundry Personal Font**, Lazy Dog Foundry, 612/291-0306, \$199.99 to \$499.99. Type 1 font made from your handwriting has clean, even lines—whether or not your writing does. **Apr 93**

★★★ **Publish It Easy 3.0**, Timeworks, 708/559-1300, \$199.95. Desktop-publishing program offers writing, editing, formatting, page-layout, drawing, and painting tools with well-thought-out interface innovations, plus an excellent database manager. Unfortunately, the program is unstable and crash-prone. **Mar 93**

★★★★ **QuarkXPress 3.2**, Quark, 303/894-8888, \$895. This upgrade adds the EfiColor XTension to ensure the greatest possible fidelity of color images and is a

must-have for professional color publishers who use Quark. For others, the enhancements are welcome but minor enough that they provide little incentive to upgrade. **Nov 93**

★★★★ **SuperATM**, Adobe Systems, 415/961-4400, \$149. This upgrade to Adobe Type Manager lets you view Adobe-brand PostScript fonts on screen and output them at high resolutions, even when the corresponding printer fonts are unavailable. Although it has limitations, this is an outstanding advance in font technology and a tremendous value. **May 93**

EDUCATION

★★★★ **Algebra**, Broderbund Software, 415/382-4400, \$89.95 to \$99.95. Interactive, imaginative math tutorial is keyed to the standard textbook order of topics, but offers much more. It is particularly strong on word problems and graphing. **May 93**

★★ **Comprehensive Review in Biology**, Queue, 203/335-0908, \$295. There isn't a textbook publisher in North America with the nerve to publish a black-and-white biology book with nothing more than text and basic line drawings, much less charge several hundred dollars for it, but that, in effect, is what this CD-ROM is. **May 93**

★★★★ **Compton's Multimedia Encyclopedia 1.00M**, Compton's New Media, 619/929-2626, \$795. The down-to-earth writing style and numerous bells and whistles of this multimedia encyclopedia on CD-ROM appeal to younger readers, but the high cost and sluggish performance may be prohibitive. **Apr 93**

★★★★ **Decimal & Fraction Maze 1.2**, Great Wave Software, 408/438-1990, \$69.95 to \$89.95. Education software weaves the threads of eight math curricula—from third grade to eighth, along with two levels of adult education—into an interesting and visually stimulating game. **Jul 93**

★★ **Dvorak on Typing 1.0**, MacPlay, 714/553-3530, \$49.95. Typing tutor offers solid lessons, but the small annoyances, such as never being able to take intermediate or advanced lessons without first passing a test, add up. **Jun 93**

★★★ **HyperStudio**, Roger Wagner Publishing, 619/442-0522, \$179.95. Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. **Dec 93**

★★★★ **MacGlobe 1.3.0**, Broderbund Software, 415/382-4400, \$44.95. Besides maps and bits of fun, such as national anthems, this geography software offers an impressive quantity of demographic and economic information. Its data export could use some work. **Feb 93**

★★★★ **Mavis Beacon Teaches Typing 2.0**, The Software Toolworks, 415/883-3000, \$49.95. If being entertained while learning to type interests you, this typing tutor provides varied environments, interesting lessons, and good games. **Jun 93**

★★★ **Millie's Math House**, Edmark Corp., 206/556-8400, \$49.95. Math-education software provides ways for preschoolers to experiment with numbers and counting. It's engaging, but more advanced levels would keep children challenged longer. **Jul 93**

★★★★ **The New Grolier Multimedia Encyclopedia**, Grolier Electronic Publishing, 203/797-3530, \$395. The scholarly text of this encyclopedia on CD-ROM is suitable for sophisticated readers, while

its speed, ease of use, and value are impressive. Apr 93

★★ **The Secret Codes of C.Y.P.H.E.R. 1.0 (1.1), Tanager Software Productions, 510/430-0900, \$59.95.** Intriguing facts about mammals and a variety of alphabets provide the interest in this educational game, but the inescapable, repetitive animations are a major detractor. Apr 93

★★★ **The Secret Island of Dr. Quandary 1.0 (1.01), MECC, 612/569-1500, \$49.95 to \$69.95.** Clever package of gorgeous landscapes, catchy sounds, and tempting arcade-game puzzles uses math, logic, and reading skills. Although slow, it's fun for parents and kids. Jun 93

★★★ **Stickybear's Reading Room 2.2a, Optimum Resource, 803/785-7441, \$59.95.** Educational game with four activities takes a sedate but direct path to building primary-level reading skills. Jun 93

★★★★ **Where in America's Past Is Carmen Sandiego? 1.0 (1.3), Broderbund Software, 415/382-4400, \$44.95.** Travel in time and the U.S. chasing those V.I.L.E. crooks in this clever educational history/geography game that's challenging for all ages. Mar 93

ENTERTAINMENT

★★★★ **A-Train, Maxis, 510/254-9700, \$69.95.** Charming railroad simulation offers astonishing, and often witty detail, but the learning curve is high and the interface isn't completely Mac-like. Apr 93

★★ **America Alive, MediaAlive/CD Technology, 408/752-8500, \$99.** QuickTime movies, photographs, maps, text, and audio mingle in this multimedia CD-ROM guide to the U.S. It's a promising concept, but it doesn't yield much useful information. Mar 93

★★★★ **Arthur's Teacher Trouble, Broderbund Software, 415/382-4400, \$59.95.** Every page of this delightful animated book is dense with surprises that arouse and satisfy a child's curiosity. In the words of six-year-old Alex, "It's like chocolate ice cream. You can have it more than once and it's still good." Apr 93

★★★★ **Battle Enhanced Chess CD ROM, Interplay Productions, 714/553-6678, \$79.95.** Elaborately detailed cartoon characters act out little dramas of strategy and capture, complete with sound effects, in this chess game that will drive nine-year-olds mad with glee but may annoy experienced chess players. Mar 93

★★★ **BlackJack Trainer, ConJelCo, 412/492-9210, \$75.** Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. Oct 93

★★★ **Cogito 1.0, Inline Design, 203/435-4995, \$59.95.** Rubik's Cube fans will like this challenging game where the goal is to replicate a pattern by moving rows and columns of tiles. It gets more and more complex as you progress through the 120 levels. Apr 93

★★★ **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, \$49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining and informative game is for you. Oct 93

★★★★ **Falcon MC 1.0, Spectrum HoloByte, 510/522-1164, \$69.95.** Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

★★★★ **Hellcats Over the Pacific 1.0.3,**

Graphic Simulations, 214/699-7400, \$69.95. Fly a WWII-era Navy fighter, the Grumman F6F Hellcat, against enemy planes in the South Pacific with this flight simulator that offers smooth graphics, good special effects, and great documentation. Apr 93

★★★ **Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3300, \$59.95.** In this game, the whip-wielding archaeologist goes looking for Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it diverting. Oct 93

★★★★ **Insanity 1.0, UV Wave, 318/868-9944, \$39.95.** Shoot your Mac with this cool control panel device that offers a choice of nine weapons, ranging from an Uzi to a pigeon. It has first-rate sound effects and detailed animation, but the novelty wears off. Feb 93

★★★★ **Jewelbox 1.5, Varcon Systems, 619/563-6700, \$49.95.** This gem of a game is strongly reminiscent of Tetris. The jewels fall into rows that disappear when you place three jewels of a kind together. Jun 93

★★★ **The Journeyman Project, Presto Studios, 619/689-4895, \$99.95.** Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

★★★★ **Maelstrom 1.03, Ambrosia, P.O. Box 23140, Rochester, NY 14692-3140, \$15 plus \$5 shipping and handling.** Fast-paced arcade game is loosely modeled after Asteroids, the Atari classic. Maelstrom features superb animation, hilarious sound effects, exciting action—and best of all, it's shareware. Jun 93

★★★★ **Monkey Island 2: LeChuck's Revenge, LucasArts Games, 415/721-3394, \$59.95.** This whimsical Twilight Zone of life on the sea is the adventure-game equivalent of *Mad* magazine, filled with splendid gross-out jokes, heapings of self-parody, and enough hilarious detail to keep you amused for days. May 93

★★★★ **Mozart: The "Dissonant" Quartet, The Voyager Company, 310/451-1383, \$59.95.** CD-ROM includes an unusual essay on stringed instruments, discussions of general musical concepts, an analytical overview of the quartet, and a taped minilecture on Mozart, but the music is limited almost entirely to the title piece. Apr 93

★★ **The Orchestra: The Instruments Revealed, Time Warner Interactive Group, 818/955-9999, \$79.98.** The many-branched, interwoven, hypertext style of this music-education CD-ROM makes it hard to navigate and digest, despite its richness. For the price, other music-education CD-ROMs present better values. Apr 93

★★★★ **Poetry in Motion, The Voyager Company, 310/451-1383, \$29.95.** Performance videos of contemporary poets are juxtaposed with the texts of their poems and taped interviews in this intriguing CD-ROM that combines the excitement of the stage with the reflective appeal of the page. Feb 93

★★★★ **Richard Strauss: Three Tone Poems, The Voyager Company, 310/451-1383, \$59.95.** Don Juan, Till Eulenspiegel, and Death and Transfiguration are included in this CD-ROM. The musical analysis is satisfying, and the lush orchestral music will appeal to both novice and experienced classical music listeners. Apr 93

★★★★ **Rodney's Wonder Window, The Voyager Company, 310/461-1383, \$39.95.** Collection of 23 colorful, wacky graphics and animations by Rodney

Alan Greenblat is charming but uneven. While some modules are elaborate and sophisticated, others are simple and not particularly interesting. Mar 93

★★★★ **Schubert: "The Trout" Quintet, The Voyager Company, 310/451-1383, \$59.95.** Alan Rich, classical music commentator for NPR, conveys his enthusiasm for this appealing music in this CD-ROM's lively text. The discussion is relatively unchallenging and the musical performance is not the top of most reviewers' lists. Apr 93

★★★★ **Seven Days in August, Time Warner Interactive Group, 818/955-9999, \$79.99.** Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961, (the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

★★★★ **Sherlock Holmes, Consulting Detective, Volume II, Icom Simulations, 708/520-4440, \$69.95.** Match wits with the legendary detective by solving three difficult mysteries in this CD-ROM game. May 93

★★★★ **SimLife, Maxis, 510/254-9700, \$69.95.** A megalomaniac's dream come true, this amazingly intricate simulation lets players create and control ecosystems. It's not easy, but the reward is an increased understanding of the complex interrelationships of life. Feb 93

★★★★ **So I've Heard, Volume 1: Bach and Before, The Voyager Company, 310/451-1383, \$24.95.** Engaging text describes nearly two millennia of western music (up to the mid-eighteenth century) in this CD-ROM. It offers a unique opportunity to sample 50 or so performances, styles, and compositions. Feb 93

★★★ **Space Quest 1: Roger Wilco in the Sarien Encounter, Sierra Online, 209/683-8989, \$19.95.** As Roger Wilco, starship janitor, you must defeat the evil Sariens in this adventure game where your head is more important than your hands. For most players the game will be easy to complete. Apr 93

★★★★ **Spectre Supreme, Velocity Development, 415/274-8840, \$69.95 to \$89.95.** The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

★★★ **Super Mines 1.0, Callisto Corp., 508/655-0707, \$49.95.** You use logic to search a minefield without setting off mines in this fast-paced game that's easy to learn, but offers 84 levels for long playability. Apr 93

★★★ **V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, \$69.95.** The post-D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

★★★★ **Who Killed Sam Rupert, Creative Multimedia Corp., 503/241-4351, \$39.99.** You're a police detective trying to solve the murder of a popular restaurateur in this interactive CD-ROM that exploits the full range of multimedia options and provides a wealth of clues and surprises to hold your interest. May 93

FINANCE/ACCOUNTING

★★ **Andrew Tobias' TaxCut for Macintosh, MECA Software, 203/256-5000, \$79.95.** The occasionally awkward interface of this personal tax-preparation software doesn't follow every Mac standard, but the

MAC WORLD

Star Ratings

help system is very good. State versions are available for California and New York. May 93

★★★★ **BestBooks 1.0, Teleware, 201/586-2200, \$99.** In a straightforward, unimposing manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

★★ **Business Sense 1.6, Software Developers Consortium, 801/288-2216, \$199.** Competent, single-user, all-in-one bookkeeping package will adequately help you keep the books for a small company, but it's not as easy to use as its competition. Feb 93

★★★★ **MacInTax 1992, ChipSoft, 619/453-8722, \$79.95.** It's difficult to correct your errors when using this personal tax-preparation software, but it's easier than doing your taxes by hand. The display is attractive and the program supports electronic filing. May 93

★★★★ **Managing Your Money 5.0, MECA Software, 203/256-5000, \$79.95.** An already strong financial-management program becomes easier to use and slightly more powerful with this upgrade. Jan 93

★★★★ **Quicken 4, Intuit, 415/898-6095, \$69.95.** Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. Nov 93

★★★★ **WealthBuilder 2.0, Reality Technologies, 800/346-2024, \$79.99.** Financial-planning software forces you to think about your money and helps you develop an investment plan. It's a good program for beginning investors, but more-sophisticated investors will want more-advanced features. May 93

GRAPHICS

★★★★ **addDepth 1.0.2, Ray Dream, 415/960-0768, \$179.** The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

★★★★ **Adobe Dimensions, Adobe Systems, 415/961-4400, \$199.** This three-dimensional-effects utility may seem very limited, with white-only light and no surface texturing, but it's a ground-breaking product. It performs its 3-D illusions within the object-oriented, resolution-independent world of PostScript. Apr 93

★★★★ **Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, \$595.** The Mac's most dependable draw program has added enough new features to boggle the mind. It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition. Nov 93

★★★★ **Adobe Photoshop 2.5, Adobe Systems, 415/961-4400, \$895.** No graphics program is as universally loved as this one, but while this upgrade builds on the program's capabilities, it ignores some minor weaknesses that have begun to peek through the product's armor. It's still great but perhaps not perfect. Jun 93

★★★★ **Alias Sketch 1.5, Alias Research, 416/362-9181, \$995.** The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

★★ **ArtBeat Professional 1.0, Pie Practical Solutions, 201/902-9500, \$249.** Despite a smat-

tering of unique capabilities, this inexpensive draw/paint program lacks features of equivalent programs. Apr 93

★★★★ **artWorks 1.0, Deneba Software, 305/596-5644, \$149.** If you're expecting a graphics dynamo, this combination paint and draw program will leave you a little cold. Despite its flaws, it ranks as one of the best graphics programs available under \$200. Jun 93

★★★★ **Blueprint 4.0, Graphsoft, 410/461-9488, \$295.** Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

★★ **BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, \$139.** If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

★★★★ **CA-Cricket Draw III 2.0, Computer Associates International, 516/342-5224, \$249.** This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward, and the price is right. Oct 93

★★★★ **Color It 2.0.1, Timeworks, 708/559-1300, \$299.95.** Overpriced color paint program has a full range of painting and image-retouching capabilities, including 15 levels of undo and an impressive magic-wand tool, but its naming conventions are bewildering. Apr 93

★★ **ColorUp 1.0, Pantone, 201/935-5500, \$99.95.** Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

★★ **CPM Graphic Tutor 1 & 2, Caseys' Page Mill, 303/220-1463, \$489 per volume.** Although some neophytes may find these CD-ROM tutorials on Adobe Illustrator and Adobe Photoshop helpful, the programs' distracting interfaces, inconsistent execution, lack of polish, and high price weigh strongly against them. May 93

★★★★ **DeBabelizer 1.5, Equilibrium Technologies, 415/332-4343, \$299.** Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

★ **Easy Color Paint 3.0, MECC, 612/569-1500, \$59.95.** For a program that purports simplicity, this color paint program is anything but. Possibly the weakest, least intuitive paint program for the Mac, it's unnecessarily complex and frustrating. Jul 93

★★★★ **ElectricImage Animation System 1.5.1, Electric Image, 818/577-1627, \$7495.** The most powerful animation program for the Mac improves its documentation and rendering, and adds an intuitive project window. Unfortunately, it still retails for the price of a European vacation for two. Feb 93

★★★★ **Expert Draw 1.0, Expert Software, 305/567-9990, \$49.95.** Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone who is on a budget. Aug 93

★★★★ **Folio 1 Media Kit-Print Pro, D'Pix, 614/299-7192, \$499.95.** Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; is free of artifacts; and is

crisply focused. Aug 93

★★★★ **Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, \$399.** If you can put up with a few inconveniences, this color paint software provides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. Jul 93

★★★★ **Generic CADD 2.0, Autodesk, 206/487-2233, \$495.** Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

★★ **Image Assistant 1.0, Caere Corp., 408/395-7000, \$495.** Besides unsatisfactorily addressing Adobe Photoshop's small list of liabilities, this image-editing software's problems include an unforgivable lack of antialiased text, no selective revert function, and an incorrectly implemented smudge tool. Apr 93

★★★★ **Kai's Power Tools Volume 1 1.0, HSC Software, 310/392-8441, \$149.** Although at times monstrously complicated, this collection of Photoshop plug-ins represents a virtually infinite supply of visual resources. It's an amazing tool that no regular Photoshop user should be without. May 93

★★★★ **MiniCAD+ 4, Graphsoft, 410/461-9488, \$795.** Professionals will appreciate this highly competent CAD package's evolution into 3-D. It has maintained its features-champion status and is easier to use. Mar 93

★★★★ **Ofoto 2.0, Light Source Computer Images, 415/461-8000, \$395.** Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

★★★★ **Paint It 1.0, Timeworks, 708/559-1300, \$59.95.** Straightforward color paint program lacks image-editing tools but has a versatile cast of selection and painting tools—and it's priced to sell. Apr 93

★★★★ **PosterWorks 3.0, S. H. Pierce & Co., 617/338-2222, \$395.** This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. Aug 93

★★★★ **PowerDraw 4.0, Engineered Software, 919/299-4843, \$795.** The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

★★★★ **Sketcher, Fractal Design Corp., 408/688-8800, \$149.** A variety of effects reproduce techniques of traditional drawing tools with this wonderful gray-scale paint and image processing program. Feb 93

★★ **StrataType 3d 1.0 (2.0), Strata, 801/628-5218, \$199.** The rulers, texture palette, custom bevels, and canned positioning schemes of this 3-D type-effects software are nice, but they can't compare with the animation skills, lighting capabilities, and superb rendering of other available programs. Mar 93

★★★★ **Transverter Pro 1.0, TechPool, 216/291-1922, \$395.** Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless,

but it can be a lifesaver nonetheless. Nov 93

★★★ **Tree, Onyx Computing, 617/876-3876, \$295.** Single-purpose program generates lifelike color drawings of trees from a number of easily controlled parameters. Although visually appealing, it's an expensive way to draw a tree. May 93

★★★ **Virtus WalkThrough 1.1.3, Virtus Corp., 919/467-9700, \$495.** Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. Jul 93

★★★ **Wraptures One, Wraptures Two, Form and Function, 619/536-9999, \$95 each.** The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

MATH/SCIENCE

★★★ **Alchemy III, Tripos Associates, 314/647-1099, \$950.** Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac IIci or better. Sep 93

★★★ **Amazing Universe 2.1, Hopkins Technology, 612/931-9376, \$79.95.** Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (ProVision II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

★★★★ **CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, \$200.** Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. Aug 93

★★★★ **Data Desk 4.0 (4.1), Data Description, 607/257-1000, \$595.** For finding patterns in data, this statistical-analysis program has no peer. Years of refinement have made it a uniquely valuable tool, despite its lack of some tests found in larger programs. May 93

★★★★ **Expressionist 3.0 (3.01), Prescience Corp., 415/543-2252, \$199.95.** If you work regularly on similar topics, you can customize this equation-writing software to produce equations with exactly the appearance you want, letting you work at amazing speed. Mar 93

★★★ **f(2) 6, Lascaux Graphics, 602/299-0661, \$115.** The main problem this math software attacks is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. Sep 93

★★★ **FASTAT 2.0, SYSTAT, 708/864-5670, \$495.** Statistical business-analysis software makes sense as a day-to-day statistics tool. It provides the right tests for most requirements, and its graph types provide plenty of information, although they lack glamour. Jun 93

★★★★ **HiQ 2.0, Bimillennium Corp., 408/354-7511, \$995.** The three great strengths of this numerical mathematics software are its fast differential-equation-solving section, its excellent matrix-math capabilities, and its natural notebook-format interface. Sep 93

★★★ **InStat 2.01, GraphPad Software, 619/457-3909, \$95.** For scientists with limited statistics back-

grounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics won't be a problem. Nov 93

★★★ **LabTutor 2.0, J. K. Eaton, 415/723-1971, \$50.** Tutorial on laboratory computer-interfacing provides a detailed, thorough exposition of computer interfacing in general, but it requires LabView and a National Instruments interface board for its exercises. Sep 93

★★★★ **MacPhase 1.2, Otter Solutions, 315/768-3956, \$159.** Low-cost, scientific-data-visualization software with a large assortment of mathematical tools is an authentic bargain. Its principal strength is a well-planned color lookup table editor that's delightfully easy to use. May 93

★★★ **MathCAD 3.1, MathSoft, 617/577-1017, \$495.** Numerical and symbolic computation software is easy to learn and use, and is much more powerful than earlier versions. It doesn't compete in scope with the largest math programs, but for most science and engineering tasks, it's a fast way to get problems solved. Jun 93

★★★★ **Mathematica 2.2, Wolfram Research, 217/398-0700, \$595.** The one essential program in science and mathematics adds a function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. Sep 93

★★★★ **MathType 3.0, Design Science, 310/433-0685, \$199.** This equation-writing software makes automatic typographical decisions, which is helpful if you produce documents on a wide range of subjects. Its smooth integration with Microsoft Word is also convenient. Mar 93

★★★★ **Spyglass Dicer 2.0, Spyglass, 217/355-6000, \$695.** Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. Jul 93

★★★★ **Spyglass Transform 3.0, Spyglass, 217/355-6000, \$595.** Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. Sep 93

★★★★ **StatView 4.01, Abacus Concepts, 510/540-1949, \$595.** If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. Oct 93

★★★ **Sum Total 1.01, Concurrent Engineering Tools, 602/464-8208, \$99.95.** Exceptional calculator utility is packed with advanced features, including a mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach causes a distinct time-lag in menu operations. Oct 93

★★★★ **Theorist 1.5, Prescience Corp., 415/543-2252, \$449.95.** Symbolic-math program that you can figure out by yourself adds a useful table feature, more special functions of physics, and better graphics. It's still the only program to use real notation directly. May 93

★★★★ **Voyager II, Carina Software, 510/352-7328, \$159.95.** If a brilliantly lit, star-filled sky holds more than a moment's fascination for you, you need to know about this astronomy program. In a firmament of mostly faint and forgettable astronomy software, it's a supernova. Jul 93

ORGANIZATION/PRODUCTIVITY

★★★ **Achieving Your Career 1.02, Up Software, 415/921-4691, \$69.** HyperCard-based job-search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. Aug 93

★★ **ACT 1.0 (1.01), Contact Software International, 214/919-9500, \$395.** While this contact manager has several laudable features, such as customizable contact views and an integrated word processor, learning how to use it is a frustrating experience. Feb 93

★★★★ **CalendarMaker 4.0, CE Software, 515/224-1995, \$59.95.** Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

★★ **ClientTrac 1.7.1, Whiskey Hill Software, 415/851-8702, \$135.** Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

★★★ **Contact Ease 2.0.1, WestWare, 619/660-0356, \$395 to \$1495.** Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks but is overall a good program. Aug 93

★★★★ **DateBook 1.5.1 (1.5.1i), After Hours Software, 818/780-2220, \$125.** Personal time manager offers a flexible approach to event scheduling and to-do-list management. This upgrade adds new features and fixes bugs that plagued the first version. Feb 93

★★★★ **DayMaker 2.0 (2.03), Pastel Development Corp., 212/941-7500, \$129.95.** If you need to organize lots of disparate information, follow up on meetings with many people, create an archive of completed work, and print out lists of to-do items, this free-form personal information manager is a great choice. May 93

★★★ **Dynodex 3.0, Portfolio Software, 408/252-0420, \$89.95.** The speed and printing options of this field-based address-book manager are its strengths, but this upgrade adds welcome improvements to the interface, including automatic formatting of phone numbers. Apr 93

★★★★ **In Control 2.0, Attain Corp., 617/776-1110, \$129.95.** The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. Aug 93

★★★★ **Inspiration 4.0, Inspiration Software, 503/245-9011, \$295.** Watch your ideas evolve in a dynamic diagram mode and a text-based outline mode with this brainstorming tool. Feb 93

★★★ **Intouch 2.0.4, Advanced Software, 408/733-0745, \$99.95.** Free-form database is a fast and easy way to manage contact information. Although this version adds a handy reminder system, it falls short as a calendar planner. Feb 93

★★★ **LapTrack For the Mac 1.0b, Timeslips Corp., 508/768-6100, \$79.95.** Time- and expense-tracking program offers the right features for the on-the-go professional, but the interface is overcomplicated and the documentation is sloppy. Still, in spite of its flaws, it does an excellent job. May 93

★★★★ **Now Up-to-Date 2.0, Now Software, 503/274-2800, \$99 to \$799.** Calendar utility com-

continues

Star Ratings

bines flexibility, ease-of-use, and streamlined operations in an almost irresistible package. The Reminder control panel, while a great new feature, has had minor conflicts. **Jun 93**

★★★★ **Power Team 1.0, ProVue Development Corp., 714/892-8199, \$149.95.** Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. **Oct 93**

★★★★ **Spiral 1.0 (1.02), Technology Works, 512/794-8533, \$129.** Designed specifically for taking and organizing notes, this product has an excellent feature set, but it's marred by some errors in the editing and import/export processes. **Mar 93**

★★ **TimeVision 1.0, Powercore, 815/468-3737, \$99.** New scheduler with notepad and card-file functions tacked on has some worthwhile features, but in general doesn't match up to the competition. **May 93**

PRESENTATION TOOLS

★★★★ **Action 1.0 (1.02), Macromedia, 415/252-2000, \$495.** Entry-level multimedia integration program offers, for its price, a rich selection of features, including a variety of transitions as well as gradient and patterned backgrounds. **Feb 93**

★★★★ **Astound 1.0, Gold Disk, 408/982-0200, \$399.** Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart in other products. It's a good value. **Nov 93**

★★ **Comet CG 1.0.3, MSI, 317/842-5097, \$995.** Program for generating antialiased text over live video is reasonably priced compared with dedicated graphics systems, but you're likely to be as astonished by its limitations as you are impressed by its capabilities. **May 93**

★★★★ **CoSA After Effects 1.1, CoSA, 401/831-2672, \$1295.** QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It produces results that simply can't be created in other packages. **Oct 93**

★★★★ **Hi Rez Audio Volume 1.0, Presto Studios, 619/689-4895, \$149.95.** The enjoyable, high-quality music on this CD-ROM adds a nice touch to presentations. The software for browsing the music is quirky, and the product could use some documentation. **Jul 93**

★★★★ **Interactive Training for Director 1.1, Media In Motion, 415/621-0707, \$199.** This somewhat expensive program teaches basic Macromedia Director skills and provides a foundation for exploring Director's other features. It has a clear, often lighthearted approach, but navigating the lessons can be frustrating. **Jun 93**

★★★★ **Macromedia Director 3.1 (3.1.1), Macromedia, 415/252-2000, \$1195.** Versatile multimedia authoring tool adds 23 scripting commands, QuickTime, and a utility that compiles movies into a faster playback format—along with a whopping \$149 addition to the price. **Feb 93**

★★★★ **Media-Pedia Video Clips, Media-Pedia, 617/235-5617, \$195 to \$495.** Fifty-seven minutes of stock footage for use in QuickTime movies includes over 150 different segments, ranging from unremarkable to dramatic to genuinely funny. **Apr 93**

★★★★ **Microsoft PowerPoint 3.0, Microsoft, 206/882-8080, \$495.** This presentation program is ahead of the pack in terms of convenience and ease of use.

Although the ready-made template collection is pretty paltry, the extensive system of master layers, reliable cross-platform compatibility, and strong on-screen presentation capabilities more than compensate. **Feb 93**

★★ **MovieWorks 1.1, Interactive Solutions, 415/377-0136, \$395.** Over 100 bugs were fixed in version 1.1 of this multimedia authoring software that takes an all-in-one approach to creating presentations, but problems remain. It's a good idea, poorly executed. **Jun 93**

★★★★ **Passport Producer 1.0, Passport Designs, 415/726-0280, \$495.** Strong timing controls and good sound capabilities mix with middling text- and image-handling and a lack of basic animation options in this partially successful multimedia program. **Apr 93**

★★★★ **Special Delivery 1.0 (1.1), Interactive Media Corp., 415/948-0745, \$399.** While this entry-level multimedia package has all the tools you need to assemble interactive screen presentations that burst with motion and sound, it has a disorienting interface and lacks the polish and power of other programs. **Mar 93**

★★★★ **VideoFusion 1.0.1, VideoFusion, 415/891-1090, \$649.** Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos, then go ahead and indulge. **Jul 93**

★★★★ **Working Model 1.0, Knowledge Revolution, 415/553-8153, \$995.** Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. **Oct 93**

PROGRAMMING

★★★★ **CLimate 1.0, Orchard Software, 617/876-4608, \$59.95.** With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irresistible package. **Oct 93**

★★★★ **EISToolKit 2.0, MicroStrategy, 302/427-8800, \$1995.** Reliable, field-tested developer's environment for creating executive information systems provides automatic access to information in spreadsheets and databases across a distributed system. **May 93**

★★★★ **FutureBASIC 1.0, Zedcor, 602/881-8101, \$299.95.** Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. **Jul 93**

★★★★ **Macintosh Common Lisp 2.0, APDA, 716/871-6555, \$495.** Anyone who likes programming in LISP will be pleased with the environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. **Oct 93**

★★★★ **MetaDesign for the Macintosh 3.0, Meta Software Corp., 617/576-6920, \$250.** This diagramming tool for structured systems analysis offers easy ways to group and ungroup symbols in diagrams and to show relationships between symbols. It excels at austere, classic flowcharts but could use some flashier features, such as shaded backgrounds, for presentations. **Mar 93**

★★★★ **Object Logo Student Edition, Paradigm Software, 617/576-7675, \$49.95.** This book-plus-disk package offers a wide-ranging introduction to programming concepts. It's aimed roughly at the high-school

educational level and lets you see something happen for every few lines of code you type. **Jul 93**

★★★★ **PG:Pro 1.5, Staz Software, 601/225-7085, \$169.** For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. **Jul 93**

★★★★ **PowerPacks 2.0, NDG Phoenix, 301/718-8880, \$225.** Programmers' tool kit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-blistering performance in most areas, though. **Oct 93**

★★★★ **SoftPolish 1.1, Language Systems Corp., 703/478-0181, \$295.** Program-quality-assurance utility systematically checks the resources in a program's interface against a huge laundry list of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. **Sep 93**

★★★★ **SourceSafe 2.1, One Tree Software, 919/821-2300, \$295 to \$1195.** Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. **Sep 93**

★★★★ **Symantec C++ for Macintosh 6.0, Symantec Corp., 408/253-9600, \$499.** If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. **Nov 93**

UTILITIES

★★★★ **7th Heaven 2.5, Logical Solutions, 612/659-2495, \$99.95.** Our reviewer found the seven enhancements to System 7 fun and elegantly done, but not all of them were useful. **Jul 93**

★★★★ **Alki Seek 2.1, Alki Software Corp., 206/286-2600, \$39.95.** Competent file-finding utility scans by file name or content and lets you combine multiple search criteria. It cannot search in the background or find text in compressed files. **Jul 93**

★★★★ **At Ease 1.0 (1.1), Apple Computer, 408/996-1010, \$59.** Sweet, simple, secure substitute for the Finder displays a clean, attractive page full of over-size icons where a single click launches a program or document. To delete, rename, or move files, you have to return to the Finder. **Mar 93**

★★★★ **Billy Steinberg's PBTools 1.0.1, Inline Design, 203/435-4995, \$99.95.** If you want basic PowerBook management without added frills or complex menu bar displays, this collection of four utilities may be just your cup of tea. **Jul 93**

★★★★ **Chameleon 2.0.3, Logical Solutions, 612/659-2495, \$59.95.** Sleek desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. **Sep 93**

★★★★ **ClickChange 2.0, Dubl-Click Software, 818/888-2068, \$89.95.** Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac's look-and-feel. **Aug 93**

★★★★ **Conflict Catcher and Other Innovative Utilities 1.0 (1.3.8), Casady & Greene, 408/484-9228, \$79.95.** Enable or disable INITs and start-up items when you boot, with this INIT manager that comes with four other system-related utilities. It's a worthwhile

investment even if you own another INIT manager. Mar 93

★★★★ **Connectix Desktop Utilities 1.0**, Connectix Corp., 415/571-5100, \$99. Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It's worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. Nov 93

★★★★ **CopyDoubler 2.0 (2.0.1)**, Fifth Generation Systems, 504/291-7221, \$59. This utility speeds up copying, lets you queue jobs for background copying, and offers a variety of other useful, copying-oriented features—all at a very reasonable price. Nov 93

★★★★ **Copyright Pro 1.0.3**, CSG Technologies, 412/471-7170, \$79. Utility takes over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. It doesn't speed up copying, however. Nov 93

★★★★ **CPU 2.0**, Connectix Corp., 415/571-5100, \$99. Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. Sep 93

★★★★ **DiskFit Direct 1.0**, Dantz Development Corp., 510/849-0293, \$49.95. Basic but efficient backup system is simple and painless enough to foster better backup habits in anyone who uses it. It doesn't back up to hard drives or tape drives. May 93

★★★★ **DriveShare 1.03**, Casa Blanca Works, 415/461-2227, \$149.95. This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. Nov 93

★★ **DynoPage 2.0**, Portfolio Software, 408/252-0420, \$89.95. While this utility simplifies the printing of booklets and double-sided pages, it doesn't support PostScript graphics, is incompatible with some popular applications, and has a buggy drag-and-drop feature. Jul 93

★ **eDisk 1.0**, Alysis Software Corp., 415/566-2263, \$149.95. Driver-level compression software has little to recommend it over file-level, idle-time compression programs. The biggest drawback is the strong potential for disk or file corruption. Oct 93

★★★★ **Icon 7**, Inline Design, 203/435-4995, \$79.95. Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. Sep 93

★★★★ **Icon-It Pro 3.0.6**, Olduvai Corp., 305/670-1112, \$129. Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. Dec 93

★★★★ **I Like Icon**, Baseline Publishing, 901/682-9676, \$59.95. Glitzy utility has tools for icon editing, has a nice library of icons, and can create animated icons. Some basic features, such as a text tool, are missing, and the animated icons are fun but impractical. Sep 93

★★★★ **INITPicker 3.0 (3.02)**, Inline Design, 203/435-4995, \$79.95. This INIT manager's ability to load aliased INITs over a network will interest network managers. While it disables problem INITs at start-up, it doesn't help you identify the cause of INIT conflicts that don't cause the Mac to crash at start-up. Mar 93

★★★★ **Inline Sync 1.0 (1.01)**, Inline Design, 203/435-4995, \$129.95. Keep the latest version of your work on your portable machine and your desktop Mac with this file-sync software. It's easy to install, easy to use,

easy on the wallet, and does the job well. Mar 93

★★★★ **KidDesk 1.0**, Edmark Corp., 206/556-8484, \$39.95. If you have young children who love to experiment with your Mac, this desktop environment provides easily navigable play while protecting your files from the havoc that little fingers can wreak. Jun 93

★★ **Magic Typist 2.0**, Olduvai Corp., 305/670-1112, \$129. If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. Sep 93

★★★★ **Magnet 1.0 (1.01)**, No Hands Software, 415/321-7340, \$129.95. Automation aids file management with this software. It creates "magnets" that trigger in response to user-specified events and automatically look for files to copy, move, or alias. Feb 93

★★★★ **Mr. File 2.0**, Softways, 408/978-9167, \$99. The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. Dec 93

★★★★ **Norton Essentials for PowerBook 1.0**, Symantec Corp., 310/453-4600, \$129. Uneven collection of PowerBook utilities ranges from the useful Instant Access module, which automatically turns AppleTalk on and off, to the relatively inaccurate Battery Gauge feature, which tries to tell you your battery's status. Apr 93

★★★★ **Now Compress 1.0**, Now Software, 503/274-2800, \$99. Compression utility holds its own in a crowded market; it's easy to use, it's complete, and it compresses as well as or better than other options. Dec 93

★★★★ **Now Fun**, Now Software, 503/274-2800, \$69. Five control panels let you live up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. Dec 93

★★★★ **Now Utilities 4.0.1**, Now Software, 503/274-2800, \$129. Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. Aug 93

★★★★ **Peace of Mind 1.2.2**, Polybus Systems Corp., 716/871-6533, \$149. Hardware diagnostic tool performs exhaustive tests on major Mac hardware components; does an excellent job of diagnosing simple simulated hardware errors. The program has minor bugs and lacks a comparative test-history feature. Jun 93

★★★★ **PicturePress 2.5**, Storm Technology, 415/691-6600, \$199. This image-compression software supports every useful storage mode, has new calculation features for improved image fidelity, and is twice as fast as version 2.0. Mar 93

★★★★ **Power To Go 2.0**, Claris Corp., 408/727-8227, \$99. PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. Dec 93

★★★★ **PowerMerge 1.0.2**, Leader Technologies, 714/757-1787, \$129. File-synchronization utility has a potentially confusing interface, but is a handy means of updating selected files so that different Macs end up with identical versions of the selected documents. Apr 93

★★★★ **Public Utilities for the Macintosh 1.0**,

Fifth Generation Systems, 504/291-7221, \$149.

Utility program sticks to the basics of disk diagnosis, disk repair, and file optimization. It does a good, and in some cases unique, job, although disk optimization is slow. Fifth Generation's technical support is excellent. Jun 93

★★★★ **RapidTrak 1.0.1**, Insignia Solutions, 415/694-7600, \$99.95. If you've got RAM to spare, this hard drive formatter offers driver-level RAM caching to store frequently used data and improve performance, especially on slower-speed drives. May 93

★★★★ **Retrospect 2.0**, Dantz Development Corp., 510/849-0293, \$249. Powerful backup and archiving software has an improved interface and scripting capabilities, and works well for all levels of users. Sep 93

★★★★ **Retrospect Remote 2.0**, Dantz Development Corp., 510/849-0293, \$449. Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. Sep 93

★★★★ **Safe and Sound**, Central Point Software, 503/690-8090, \$49.95. Limited but useful disk-protection and -salvage utility has a clean, simple interface and is an efficient emergency recovery tool. Jun 93

★★ **Safe or Sorry 1.0**, Olduvai Corp., 305/670-1112, \$59. Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

★★ **SafeDeposit 1.2**, Dayna Communications, 801/269-7200, \$189. Automated backup program is easy to set up but slow. Also, unattended backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. Sep 93

★★★★ **Screenscapes 1.0.1**, Kiwi Software, 805/685-4031, \$44.95. With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93

★★★★ **Square One 1.5.2**, Binary Software, 310/582-8293, \$74. Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. Aug 93

★★ **Stacker for the Macintosh 1.0.1**, Stac Electronics, 619/431-7474, \$149. As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93

★★★★ **Star Trek: The Screen Saver**, Berkeley Systems, 510/540-5535, \$59.95. Go where no Mac has gone before with this screen saver based on the original "Star Trek." May 93

★★★★ **Star Wars Visual Clips**, Sound Source Unlimited, 805/494-9996, \$89.95. Control panel lets you play QuickTime movie clips from *Star Wars* at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will make you remember why you love your Mac. Sep 93

★★★★ **Stuffit Deluxe with SpaceSaver 3.0**, Aladdin Systems, 408/761-6200, \$120. Its many conversion tools, automatic compression capabilities, reliability checks, and acceptable performance make this product the jack-of-all-trades of compression utilities. Aug 93

★★★★ **Super 7 Utilities**, Atticus Software, 203/continues

Star Ratings

324-1142, \$99.95. Collection of seven control panels/extensions adds some ease of use to System 7, although none of its functions are essential. Modules perform tricks such as turning any menu into a tear-off palette, and randomizing the sounds that play in response to errors. Apr 93

★★★ **TimesTwo 1.0.1, Golden Triangle Computers, 619/279-2100, \$149.** Automatic disk-compression utility operates at the disk-driver level. A number of quirks, such as its ungraceful handling of full disks, are problems. May 93

★★★★ **TonerTuner 1.0.3, Working Software, 408/423-5696, \$24.95.** Inexpensive, incredibly useful extension adds a sliding bar to print dialog boxes, allowing you to adjust the amount of toner applied to each print job. If you can't save trees, you can at least save toner. Dec 93

★★★★ **ultraShield 1.252, usrEZ Software, 714/756-5140, \$149.** Sophisticated security product combines practically every feature you might need into an integrated package, including a lightning-fast version of the U.S. government data-encryption standard. Dec 93

★★★★ **Virtual 3.0.1, Connectix Corp., 415/571-5100, \$99.** If you need to eke out as much virtual memory speed as possible, this utility may be a useful tool. For System 6 users who want virtual memory, it's the only game in town. Sep 93

★★★★ **Voice Navigator SW 2.3, Articulate Systems, 617/935-5656, \$399.** Talk back to your Mac (if it has built-in sound input) with this speech-recognition software. Defining macros can be frustrating, but the product is a real boon for disabled users. Jan 93

★★★★ **WonderPrint 1.0, Delta Tao Software, 408/730-9336, \$59.** StyleWriters and DeskWriters produce half-tones good enough for newsletters with this printing extension. Jan 93

VERTICAL MARKETS

★★★★ **Compare-A-Loan 4.0.2 (4.1), Softflair, 612/894-3357, \$79.95.** Although geared to professionals, this product for home-loan evaluation provides thorough documentation and is structured so that anyone can use it. Apr 93

★★★★ **Expert Home Design 1.0 (1.0.3), Expert Software, 305/567-9990, \$49.95.** Quickly and easily create home- or office-interior layouts that are precise, but not as detailed as blueprints, with this interior design software. May 93

★★ **Expert Landscape Design 1.0 (1.0.2), Expert Software, 305/567-9990, \$49.95.** Bare-bones drawing environment for experimenting with landscape design is inexpensive, but its usefulness is severely limited because of awkward color and pattern tools. Feb 93

★★★★ **Finale 3.0.1, Coda Music Technology, 800/843-2066, \$749.** Upgraded music-notation software is now infinitely more pleasant to use. Its comprehensive feature set makes it the standard against which all other music-notation products must be judged. Dec 93

★★★★ **LoanLease Library 3.0.3 (3.05), Softflair, 612/894-3357, \$99.95.** If you are generating a loan or a lease and need to keep track of payments, this well-documented program for loan evaluation is a worthwhile investment, despite its minor eccentricities. Apr 93

★★★★ **Musichop 1.0, Opcode Systems, 415/856-3333, \$149.95.** MIDI sequencer is an excellent choice as a first sequencer. It's powerful enough to

satisfy the needs of most MIDI users. Oct 93

★★★★ **Roll Call 2.0, By the Numbers, 603/927-4508, \$495.** 4th Dimension database application for church management helps track donations, attendance, church-group membership, and visitation. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

★★★★ **Sailing Master 1.1, Starboard Software, 313/662-4393, \$64.99.** Though the slow speed and jerky motion point to less-than-polished programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

★★★★ **Stat-Ref 3.2a (3.2b), Teton Data Systems, 307/733-5494, \$95.** Medical database on CD-ROM is not suitable for research, but it could effectively replace a small reference library in an office. Jan 93

WRITING TOOLS

★★★★ **Final Draft 2.0 (2.0.3), MacToolkit, 310/395-4242, \$349.** Script-writing gets simpler with this well-conceived software that automates formatting of different elements in a script. Customization is easy, and macros automate typing of common phrases. Apr 93

★★★★ **IdeaFisher 2.0, Fisher Idea Systems, 714/474-8111, \$595.** Inspiration never comes easily, but this creativity tool might help get the juices flowing. Jan 93

★★★★ **Just Joking 1.0, WordStar International, 415/382-8000, \$49.** HyperCard stack of around 2800 humorous quotations offers a serviceable selection of sayings from a diverse group of humorists, comedians, philosophers, and writers, among others. Apr 93

★★★★ **LetterPerfect for Macintosh 2.1, WordPerfect Corp., 801/225-5000, \$149.** Stripped-down version of WordPerfect measures up as a serviceable low-end word processor, with clean, accurate documentation and an uncluttered interface. Jan 93

★★★★ **MacWrite Pro, Claris Corp., 408/987-7000, \$249.** Many of the new features of this upgrade are very well executed, including the easy-to-use table feature, simple but elegant palettes, and an almost pain-free mail merge feature. Jul 93

★★ **MasterWord 5.1, Alki Software Corp., 206/286-2600, \$99.95.** The centerpiece of this package of add-on Microsoft Word commands is a set of customizable tool bars. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

★★★★ **Microsoft Word 5.1, Microsoft, 206/882-8080, \$495.** Small, solid upgrade fine-tunes some plug-in modules and adds new modules including an icon tool bar and text annotation. It's worth the upgrade price, but it won't give Word 5.0 users goosebumps. Mar 93

★★★★ **RightWriter for the Mac 5.0, Que Software, 317/573-2500, \$99.95.** Grammar checker looks at writing style, word usage, punctuation, and capitalization, as well as grammar. Customizable filters and multiple approaches to analysis are nice, but—as with all grammar checkers—not all the advice is great. May 93

★★★★ **ShowScape 4.1, Lake Compuframes, 914/941-1998, \$429 to \$679.** This script-writing software formats scripts in either screenplay format or dual-column format (for audio and video) and allows you to choose the number of shots displayed per page, but it requires you to own and work in WordPerfect. Apr 93

★★★ **Spelling Coach Professional 4.0.1, Deneba Software, 305/596-5644, \$195.** If you're considering investing in reference software, this spelling checker, dictionary, and thesaurus is a relatively capable, if expensive, alternative. Oct 93

★★★★ **Thunder 7 1.5.3, Baseline Publishing, 901/682-9676, \$99.95.** Stand-alone spelling checker and thesaurus interactively monitors your keystrokes and alerts you to potential errors as they are entered. It quickly and transparently prevents you from making embarrassing typos. Nov 93

★★★★ **TypeReader 1.0, ExperVision, 408/428-9988, \$695.** Speed and accuracy combine with a straightforward operating style in this high-end OCR software that doesn't do everything its competition does, but is a major contender nonetheless. Feb 93

★★★★ **VersionMaster 1.5, AStar Technologies, 508/486-8532, \$199.95 to \$1199.95.** Document-management utility helps you archive and track versions of a file by maintaining a database of altered documents. It's recommended only for workgroups that routinely follow check-out procedures. Apr 93

★★★★ **A Zillion Kajillion Rhymes 1.0, Eccentric Software, 206/628-2687, \$49.95.** Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores -ed, -s, and -ing endings). Nov 93

Hardware

MISCELLANEOUS HARDWARE

★★ **ACS100, Altec Lansing Consumer Products, 717/296-2818, \$180.** Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

★★ **ACS150, Altec Lansing Consumer Products, 717/296-2818, \$150.** Subwoofer rounds out the sharp tones of the ACS100, but the bass response is neither punchy enough nor loud enough, and the unit is about the size and weight of a concrete block. Dec 93

★★ **Address Express, CoStar Corp., 203/661-9700, \$795.** Flaky performance and system crashes plagued this envelope-and-label printer in our tests, but the print quality was good. Oct 93

★★ **Apple Adjustable Keyboard, Apple Computer, 408/996-1010, \$219.** Keyboard is only a slight improvement on the flat slab keyboard. Theoretically, it corrects ulnar deviation, but sufferers of repetitive stress injuries want a keyboard that adjusts vertically. Jul 93

★★★★ **Apple Color OneScanner, Apple Computer, 408/996-1010, \$1349.** Tests of this color scanner demonstrate unpolluted colors and sharp image details, perhaps due to color filters and lenses that Apple claims were specially designed and tuned for the scanner. Jul 93

★★★★ **Apple Newton MessagePad, Apple Computer, 408/996-1010, \$699.** Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. Dec 93

★★★★ **AppleCD 300, Apple Computer, 408/996-1010, \$599.** Double-speed CD-ROM drive spins

its discs at twice the speed of earlier drives, providing faster access to large files. Jun 93

★★★★ **AppleDesign Powered Speakers, Apple Computer, 408/996-1010, \$179.** Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

★★★★★ **ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, \$449.** Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics programs. Aug 93

★★★★ **Computer Crayon, Appoint, 510/463-3003, \$49.** The kid contingent's verdict was a definite thumbs-up on this brightly colored input device that's shaped like a thick pencil. The buttons can be hard for smaller children to press, and serious computer artists should still opt for a drawing tablet. Oct 93

★★★★★ **Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, \$2600.** Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newsprint publications and some catalogs. Dec 93

★★★★ **EMBARC, Embarc Communications Services, 407/364-2000, \$395 plus fees.** If you're a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. Sep 93

★★★★★ **Epson ES-800C, Epson America, 310/782-0770, \$1499; Macintosh interface kit \$399.** Flexible 400-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package. Aug 93

★★ **Gulliver, Appoint, 510/463-3003, \$119.** This diminutive mouse is hard to hold comfortably for an extended period, but it works well on almost any surface, and is an acceptable option for PowerBook users. Oct 93

★★★★ **Hello Music, Yamaha Corp. of America, 714/522-9240, \$449.95.** MIDI starter kit includes an impressive tone generator that's compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. Dec 93

★★★★ **LightningScan Portable, Thunderware, 510/254-6581, \$459.** PowerBook owners will find this hand scanner's modem- or serial-port connection, lightweight interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. Dec 93

★★★★★ **Media Control Station 1.0 (1.01), JLCopier Electronics, 310/306-4131, \$269.95.** Versatile tool connects to the Mac through an ADB port and offers an easy and intuitive way to cue and edit QuickTime movies, MIDI files, and other dynamic data. Feb 93

★★★★ **mira 35, Santos Technology, 310/320-8888, \$2695.** This 35mm slide scanner puts many sophisticated color-correction tools into a low-cost package. It does have trouble resolving extremely fine details, and its color correction is RGB only. Oct 93

★★★★ **Organizer Link II (Model OZ-893), Sharp Corp., 800/321-8877, \$129.99.** If you own a 5000-, 7000-, or 8000-series Sharp Wizard, this program and cable let you connect it to a Mac serial port to exchange data. It's functional, but has some minor weaknesses. Jan 93

★★★★ **PhonePro 1.0.3 (1.1.5), Cypress Research Corp., 408/752-2700, \$950.** Application makes it relatively easy to develop a multiple-choice voice-mail system using your Mac, especially for those with programming backgrounds. Feb 93

★★★★ **PowerLink Presenter, E-Machines, 503/646-6699, \$499.** Simple, compact Duo dock wobbles a bit when plugged in but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. Nov 93

★★★★ **ScanMaker 35t, Microtek, 213/321-2121, \$1999.** Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is weak. Dec 93

★★★★ **ScanPlus Color 6000 for Mac, PlusTek USA, 408/980-1234, \$749 to \$899.** Small, inexpensive sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, economical option. Sep 93

★★★★ **The UnMouse, MicroTouch Systems, 508/659-9000, \$199.** Input device is a cursor-control device, programmable keypad, and small graphics tablet in one, and can be programmed with 60 macros (although only 16 can be selected by sight). It's ergonomically better than a mouse, but not as good as a trackball. May 93

★★★★ **Yamaha TG100, Yamaha Corp. of America, 714/522-9011, \$449.** Compact, keyboardless, multitimbral MIDI synthesizer adheres to the General MIDI standard patch arrangement. Although it won't convince you that you're hearing a live orchestra, the sound is about as realistic as low-cost MIDI gets. Apr 93

MODEMS/NETWORK HARDWARE

★★★★★ **AsantéHub 1012, Asanté Technologies, 408/435-8388, \$1299.** This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. Dec 93

★★★★ **DataLink PB; Axcell Cellular Interface, Applied Engineering, 214/241-6060, \$824.** If you need a full-blown office on the beach, this PowerBook cellular-modem package with automatic answering machine is a well-executed solution. Each recorded second requires 25K of disk space. Nov 93

★★★★★ **PathFinder, Dayna Communications, 801/531-0600, \$899.** For simple networks, this LocalTalk-to-Ethernet router is a great value, as well as a great time-saver for beginning network managers. It uses AppleTalk only. Jan 93

★★★★ **PerFit Port-A-Com, PerFit, 303/530-7333, \$349.** Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. Nov 93

★★★★★ **Sportster 14,400 Fax/Data Modem, U.S. Robotics, 708/982-5001, \$329.** Several nice features, including an easily accessible power button and a front-mounted volume-control dial, make this 14,400-bps fax/data modem better than average. Feb 93

★★★★ **SupraFaxModem 144PB, Supra Corp., 503/967-2400, \$349.95.** If you're looking for a high-speed internal modem for your PowerBook, and want to save a few bucks, this modem is worth considering. Disabling its fax software solved occasional transfer problems. Nov 93

★★ **Viva 14.4/Fax, Computer Peripherals,**

805/499-5751, \$299. In data mode, this 14,400-bps fax/data modem performed well, but the software bundled with it is barely adequate. Jan 93

★★ **WorldPort 9600 MNP5, U.S. Robotics, 708/982-5001, \$499.** Only slightly larger than a deck of cards, this 9600-bps modem is geared toward PC users, with a user guide that never mentions Macs and software that is only for PC compatibles. Jan 93

PRINTERS

★★★★ **Apple Color Printer, Apple Computer, 408/996-1010, \$2349.** If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. Aug 93

★★★★★ **DECLaser 1152, Digital Equipment Corp., 508/493-5111, \$999.** Four-pages-per-minute, 300-dpi, PostScript Level 2 printer offers simultaneous support for Macs and PCs, plus excellent image quality, for a ground-breaking price. May 93

★★★★★ **HP LaserJet 4M, Hewlett-Packard, 800/752-0900, \$2399.** An Intel i8960 RISC processor makes printing complex images faster than ever with this 600-dpi printer. Feb 93

★★★★ **LaserWriter Pro 600 and 630, Apple Computer, 408/996-1010, \$2099 to \$2529.** From their paper handling to their print quality, these laser printers are Apple's best. Unfortunately, they don't support emulation-sensing, and thus may be less desirable for mixed-platform offices than other possibilities. Jun 93

★★★★★ **LaserWriter Select 300, Apple Computer, 408/996-1010, \$839.** Inexpensive, low-capacity printer is networkable, and an excellent buy, despite a few weaknesses. Add a 4MB SIMM to take advantage of the amazing PhotoGrade capabilities, which allow the printer to generate 91 shades of gray. Aug 93

★★ **LaserWriter Select 310, Apple Computer, 408/996-1010, \$1099.** This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communications Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides. Aug 93

★★★★★ **MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, \$999.** Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. Dec 93

★★★★ **Phaser 200i Color Printer, Tektronix, 503/682-7377, \$5995.** This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopy bond. Aug 93

★★ **PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, \$2450.** While this multiplatform printer is fast and prints clearly, many Mac users will find it frustrating as it can't print some TrueType fonts. Jul 93

★★★★★ **StyleWriter II, Apple Computer, 408/996-1010, \$359.** Apple's ink-jet printer retains the best features of its predecessor, but costs less. New features, such as gray-scale printing and the ability to share the printer over a network, make it even more versatile. Jun 93

★★★★ **WideWriter, GCC Technologies, 617/ continues**

Star Ratings

275-5800, \$1699. Large-format output is reasonably priced with this ink-jet printer that can automatically feed sheets as large as 14 by 91 inches or manually feed sheets 17 inches wide with an unlimited length. Feb 93

★★★ **WriteMove II, GCC Technologies, 617/275-5800, \$599.** Portable printer for the PowerBook measures 11½ by 2 by 3½ inches and weighs 2½ pounds. It's no speed demon, but it's fine for short jobs. May 93

SYSTEMS/STORAGE

★★★ **DataPak 105, Mass Microsystems, 408/522-1200, \$949 to \$1049.** Well-built 105MB SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. Sep 93

★★★ **FastCache Quadra, Daystar Digital, 404/967-2077, \$299 to \$449.** PDS board provides 128K of secondary cache for a Quadra. The average real-world speed improvement is 15 percent, but some operations benefit more from the cache card than others. May 93

★★★ **Infinity 105 Turbo, Peripheral Land, 510/657-2211, \$795 to \$894.** Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. Sep 93

★★★ **Infinity Optical 3.5, Peripheral Land, 510/657-2211, \$1999.** If you need the extra measure of permanence that magneto-optical storage provides—or a compact alternative to bulky cartridges—this drive, based on a Sony mechanism and using 3½-inch disks that store 120MB of data, deserves a look. Jun 93

★★★ **Macintosh Centris 610, Apple Computer, 408/996-1010, 4/80 \$1859.** Slim-design Mac uses a 20MHz 68LC040 processor at a price-to-performance ratio that comes close to competing with Windows PCs; however, its expandability is severely limited. Jun 93

★★★ **Macintosh Centris 650, Apple Computer, 408/996-1010, 4/80 68LC040 \$2699.** Moderately priced but fast 040 system offers three expansion slots and one drive bay, and (except for the base model) has built-in Ethernet, video circuitry, and a math coprocessor. This desktop Mac is as powerful as a Quadra 700. Jun 93

★★★ **Macintosh Duo Dock, Apple Computer, 408/996-1010, \$1079.** Clever housing for Duos provides back-panel connectors, a SuperDrive, support for external monitors, and two expansion slots. Some details, such as the difficulty of installing NuBus boards, belie Apple's usual attention to detail. Mar 93

★★★ **Macintosh LC III, Apple Computer, 408/996-1010, 4/80 \$1349.** Base system comes equipped with a 25MHz 68030 processor and 512K of VRAM. This is a machine that fits the bill and the pocket-book of most home or small-business owners. Jul 93

★★★ **Macintosh PowerBook 145, Apple Computer, 408/996-1010, 4/40 \$2149.** Adequate but essentially outdated notebook computer is an upgraded PowerBook 140 with a faster 25MHz 68030 CPU. Feb 93

★★★ **Macintosh PowerBook 160, Apple Computer, 408/996-1010, 4/40 \$2429.** A built-in video port and gray-scale capability are the new features Apple offers with this notebook computer. While it offers good processing speed and power, the passive matrix display doesn't cut it for all-day use. Feb 93

★★ **Macintosh PowerBook 165c, Apple Computer, 408/996-1010, 4/80 \$3399.** The passive

matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant environment in which to work. Jul 93

★★★ **Macintosh PowerBook 180, Apple Computer, 408/996-1010, 4/80 \$4109.** An active matrix screen and math coprocessor are the only differences between this computer and the PowerBook 160, but the beautiful display is worth the extra \$1000. Feb 93

★★ **Macintosh PowerBook 180c, Apple Computer, 408/996-1010, 4/80 \$4169.** The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. Sep 93

★★★ **Macintosh PowerBook Duo 210 and 230, Apple Computer, 408/996-1010, 210 (4/80) \$1839, 230 (4/80) \$2299.** Apple's smallest computers have the pleasing heft of hardbound books but pack the horsepower of 030 chips. Although the screen, keyboard, and trackball feel small, these computers virtually cry out to be picked up and used. Mar 93

★★★ **Macintosh Quadra 800, Apple Computer, 408/996-1010, 8/230 \$4679.** Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. Aug 93

★★★ **MicroMac Plus Upgrade System, MicroMac, 714/362-1000, \$998.** This 68030 accelerator for the Mac Plus requires disassembling a Plus and using the Plus system board to assemble the MicroMac system. It speeds up the Plus dramatically, and supports an included external full-page monochrome monitor. Jun 93

★★★ **MultiDisk 150, Iomega, 801/778-1000, \$1225.** Durable cartridges are one of the strongest reasons to choose this Bernoulli removable drive. Although it's slightly more expensive than a SyQuest drive, it's fast and reliable, and the disks are competitively priced. Jun 93

★★★ **OrangePC, Orange Micro, 714/779-2772, \$1799.** NuBus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. Oct 93

★★★ **PLI MiniArray 850MB, PLI MiniArray 2GB, Peripheral Land, 510/657-2211, \$4999, \$6999.** These RAID storage systems contain multiple drives that work as a single unit; they're an excellent option for image processing or tasks that involve importing and exporting large files, but the price per megabyte is high. Jan 93

★★★ **PowerBook 140 F/25 Upgrade, Digital Eclipse Software, 510/547-6101, \$399.** By changing the oscillators and adding an FPU, Digital Eclipse changes PowerBook 140s into 170s, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. Dec 93

★★★ **Quadra 840AV, Apple Computer, 408/996-1010, 8/230 \$4069.** Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. Dec 93

★★★ **SmartStack, Envisio, 612/628-6288, SmartSource \$119; SmartModules \$289 to \$1379.** The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. Sep 93

★★★ **Turbo 040, DayStar Digital, 404/967-2077, \$1899.** This accelerator card is equipped with the

fastest 68040 chip available, and is as fast as or faster than any Macintosh in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. Dec 93

VIDEO/DISPLAY

★★★ **AudioVision 14 Display, Apple Computer, 408/996-1010, \$769.** Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. Dec 93

★★★ **BookView Imperial, Computer Care, 612/371-0061, \$1399 (includes 6MB of RAM).** This notebook-display adapter supports all common sizes of monitors. It is expensive, however, and uses 2MB of system memory for video processing. Feb 93

★★★ **Dycam Model 3, Dycam, 818/998-8008, \$895.** Low-end, digital still camera is easy to use, and is a solid product if Instamatic grade gray-scale meets your image quality requirements. Sep 93

★★★ **Editing Aces Suite, RasterOps, 801/785-5750, \$3899.** Video professionals can record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound with these products. Despite flaws, this package represents a step forward in QuickTime technology. Nov 93

★★★ **L-TV, Lapis Technologies, 510/748-1600, \$349.** Interface board allows a Mac LC, LC II, or Performa to use a TV as a display. Unfortunately, a TV is a poor substitute for a monitor, so while the L-TV does its job, the setup is unsuitable for many applications. May 93

★★★ **Lightning Effects II, Spectral Innovations, 408/955-0366, \$1295.** Digital-signal-processor chips dramatically speed up some Photoshop operations with this expensive Photoshop-acceleration board. It had problems acquiring some JPEG files. May 93

★★★ **MovieMovie, Sigma Designs, 510/770-0100, \$349.** This 7-inch NuBus video-capture board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. Dec 93

★★★ **PaintBoard Turbo, RasterOps, 408/562-4200, \$1499.** Midrange video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. Oct 93

★★★ **Power Portrait, Sigma Designs, 510/770-0100, \$899 or \$949.** Hook your Classic or PowerBook to this 15-inch portrait-style monochrome display. Built-in QuickDraw acceleration speeds up the slow SCSI connection on the one hand and results in a few software incompatibilities on the other. Feb 93

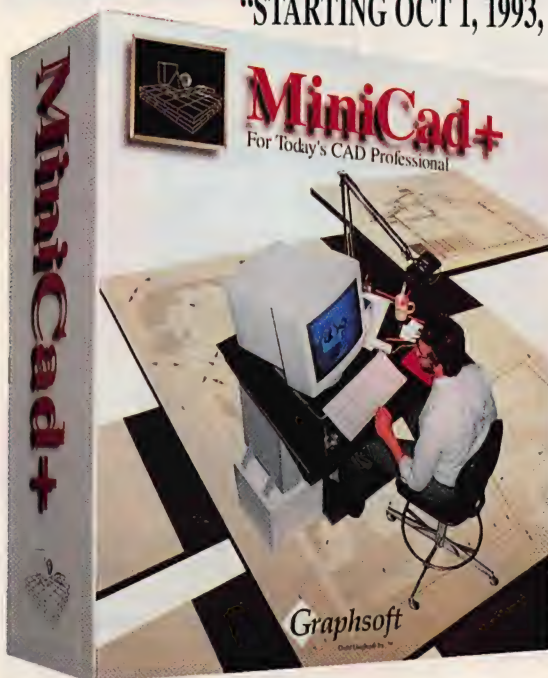
★★★ **PowerVision, Mirror Technologies, 612/633-4450, \$499 to \$999.** Separate VRAM means you don't lose system memory with this nicely priced notebook display adapter. Feb 93

★★★ **ThunderStorm, SuperMac Technology, 408/245-2202, \$699.** Photoshop-acceleration board uses digital-signal-processor chips to speed up some Photoshop operations. It's fast, with good JPEG compatibility and a great manual. May 93

★★★ **VideoToolkit 2.0.1, Abbate Video, 508/376-3712, \$2799.** Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. Sep 93 **m**

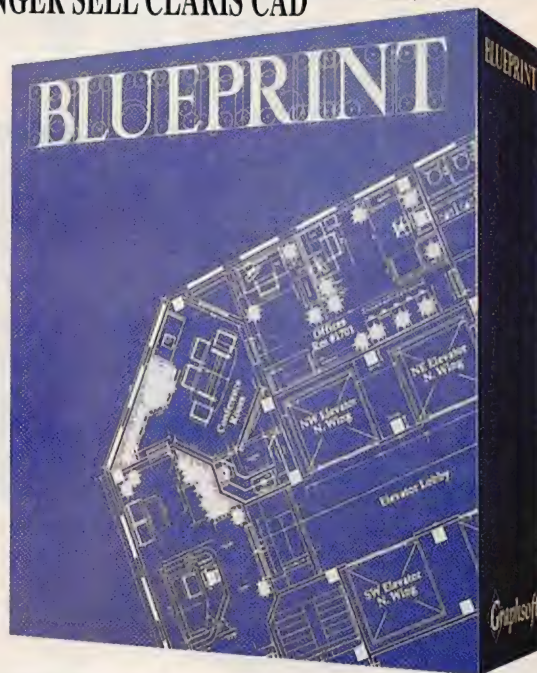
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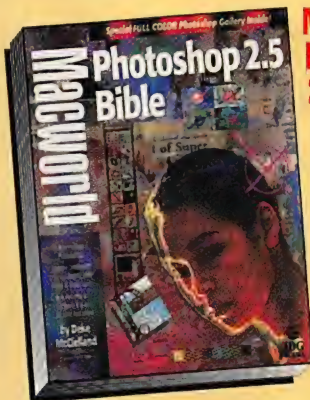


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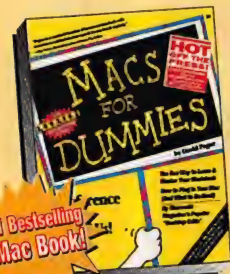
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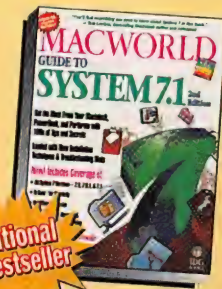
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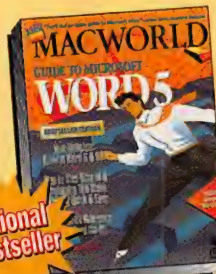


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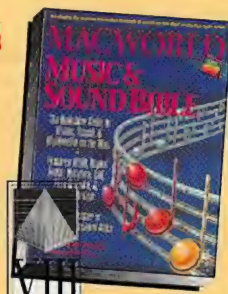
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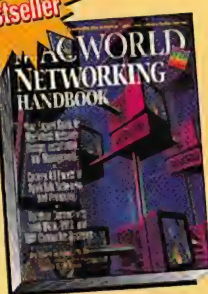


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Selected and edited by Charles Barrett

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Listings indicate the star rating awarded in *Macworld's* Reviews (products rated ★★ or lower are not eligible to be listed), if the product has been chosen as an **Editors' Choice**, and if it has won a **World-Class** award. In some cases, the editorial evaluation quoted is for an earlier product version.

BUNDLES

Business Images + Business Cartoons T/Maker is including a \$59.95 collection of over 100 images by nationally syndicated cartoonist Phil Frank free with its \$59.95 collection of over 1000 business-related images. Available direct (800/395-0195) for \$39.95. *Offer expires 5/30/94.*

L-TV + Kid's Studio Lapis Technologies is including Cyber Puppy Software's \$59.95 Kid's Studio—an introduction to multimedia production—free with its \$349-to-\$549 L-TV series of television interface cards (May 93 ★★—“economical way to capture images to video”). Available through resellers including CompUSA (800/451-7638), ComputerWare (800/326-0092), MacWarehouse (800/225-6227), and Mac's Place (800/367-4222). *Offer expires 12/31/93.*

NetWare for Macintosh 3.12 + MacLinkPlus Easy Open Translators 7.5 Novell is including a 30-day trial version of DataViz's \$109 MacLinkPlus translation library free with every upgrade to its 200-user license (\$995) for NetWare (Sep 93 “Connecting to NetWare” **Editors' Choice** for version 3.11—“provides a level of integration that other products lack”). Available direct (512/834-6905, 800/336-3892) for \$200. *Offer expires 2/28/94.*

SuperSet Utilities + Help Datawatch is bundling Teknosys's \$149 Help personal desktop configuration problem-solver with its \$149.95 SuperSet Utilities, which includes Virex 5.0 virus fighter, Citadel with Shredder 1.1 (Feb 93 “Data Guardians” **Editors' Choice** for initial release—“cheapest way to get secure encryption and file erasure”; Jun 92 ★★★★★—“feature packed,” “easy to use”), ScreenLink for remote Macintosh control and file transfer, 911 Utilities, and Complete Undelete. Available through MacConnection (800/800-2222) for \$99. *Offer expires 12/31/93.*

UPCTools + POSTools Azalea Software is including its \$59 POSTools for creating POSTNET bar code for zip codes free when you purchase UPCTools. Both of these Type 1 PostScript font packages for creating bar codes on printers and imagesetters are available direct (206/937-5919, 800/482-7638) for \$149. *Offer expires 3/1/94.*

WordPerfect Works 1.2 + In Control 2.0 The

Mac Zone is bundling WordPerfect's \$249 integrated software (Jun 93 ★★★★★—“modules well integrated,” “includes very good word processor”) with Attain's \$129.95 to-do list organizer (Aug 93 ★★★★★—“combines the best features of an outlining program with those of a database”). Available through The Mac Zone (800/248-0800) for \$97.98. *Offer expires 1/31/94.*

COMPETITIVE UPGRADES

Blueprint 4.0; MiniCad+ 4 Graphsoft is offering users of the discontinued Claris CAD its \$295 Blueprint drafting program (Jul 93 ★★★★★—“a lot of performance for the [list] price”; Jan 93 “2-D CAD Broadens Its Scope” **Editors' Choice** for low-end 2-D CAD) or its advanced \$795 broad-based 2-D/3-D MiniCad+ application (Mar 93 ★★★★★—“fast,” “complete”) for \$195 and \$495, respectively. Call direct (410/290-5114) to order and for proof-of-purchase requirements.

ColorAccess PixelCraft (formerly Barneyscan Corp.) is offering this new version of its \$995 commercial-quality color production software to users of competitive products such as Cachet, Ofoto, or Spectra Print for \$300 on trade-in. Call 800/933-0330 or 510/562-2480 for details. *Offer expires 12/20/93.*

Pro Imager 7650C Color Scanner PixelCraft is offering a \$2500 credit toward the purchase of this \$11,995 color and gray-scale A3 scanner to users who trade in their old scanners, regardless of operating condition or original cost. Call 800/933-0330 or 510/562-2480 for nearest reseller and redemption requirements. *Offer expires 12/20/93.*

SyQuest Drives SyQuest Technology is offering \$50 plus a free internal or external 5¼-inch 88MB or 3½-inch 105MB drive (complete with cabling, drivers, and a cartridge) to Iomega users who trade in their 90MB or 150MB Bernoulli removable media drives. (See Aug 93 “Choosing a Storage Strategy.”) Call 800/245-2278 for particulars. *Trade-ins will be accepted at least through 12/31/93.*

DISCOUNTS/REBATES

Adobe Streamline 3.0 Adobe Systems is offering a new version of this \$199 tool for converting black-and-white and color bitmapped images to PostScript line art (Sep 89 review for initial release). Available direct (800/642-3623) for \$99. *Offer expires 12/31/93.*

DeltaGraph Pro 3 DeltaPoint is offering a special introductory price on this new version of its \$195 charting and graphing package (May 92 ★★★★★ for version 2.0—“best general-purpose business and technical charting program available”; 1993 **World-Class**). Available through retail and mail order for \$79.95. *Offer expires 1/31/94.*

Dysan High-Density Diskettes Dysan International is offering an additional five disks free to customers who purchase

15 high-density 3½- or 5¼-inch formatted disks. Effective 11/1/93, specially wrapped boxes of 20 disks will be available through resellers. *Offer expires 12/31/93.*

HP LaserJet 4M Hewlett-Packard is offering a \$100 rebate on the selling price of this 600-dpi laser printer (Feb 93 ★★★★★—“new print engine and toner guarantee smooth curves and crisp characters”) when purchased after 10/1/93. Call 800/354-7622 for your nearest authorized reseller and proof-of-purchase requirements. *Offer expires 12/31/93.*

Mac Zone Instant Access CD The Mac Zone has teamed up with Instant Access International to distribute a free (except for \$1.95 postage and handling) interactive CD-ROM catalog that provides multimedia guided tours, working demonstrations, and comprehensive information for over 150 encrypted software products being offered at lower prices than traditional software in a box; all it takes is a phone call to purchase and decrypt complete applications. Updated CD-ROMs with new packages and upgrades will be issued every two or three months. To receive a free disc of the catalog, call 800/684-8080.

MacInTax ChipSoft is offering a \$10 rebate (retail packages contain rebate coupon) on the purchase of a 1993 federal version of this \$69.95 personal tax-preparation program (May 93 ★★★★★—“preferable to completing complicated taxes by hand—and still a bargain”) and a \$39.95 state version. Users who have bought from ChipSoft before can purchase this renewal version direct (800/964-1040) for \$29.95 (\$19.95 for state version).

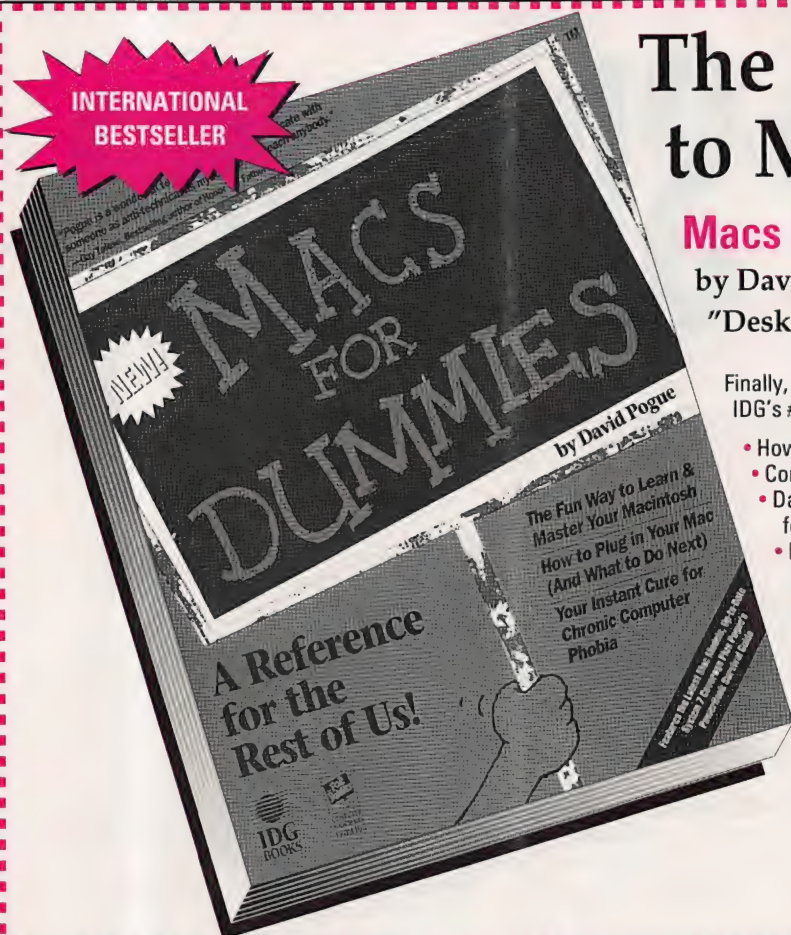
Mail Link for PowerTalk/QM StarNine Technologies is offering a special introductory half-off price on this AOCE gateway for providing E-mail connectivity between PowerTalk and CE Software's QuickMail. Available direct (510/649-4949) for \$49.50 (single user), \$199.50 (five-user pack), and \$299.50 (ten-user pack). *Offer expires 1/31/94.*

Microsoft Office 3.0; Microsoft Works 3.0 Microsoft is offering a \$100 rebate on its \$750 Microsoft Office integrated business-application software (either disk or CD-ROM) that includes Word 5.1 (Mar 93 ★★★★★), Excel 4.0 (Oct 92 ★★★★★), PowerPoint 3.0 (Feb 93 ★★★★★), and Microsoft Mail 3.1. A \$50 rebate is also available on its \$249 Microsoft Works integrated software (Feb 93 ★★★★★) and on the \$348.95 combination pack of Works and TrueType Master Set. Call 800/622-4445 for redemption requirements. *Offer expires 1/31/94.*

Ray Dream Designer 3.0 Ray Dream is offering this \$349 three-dimensional imaging software (Sep 92 ★★★★★ for version 2.02; Aug 93 “Depth-Defying Design” **Editors' Choice** for version 2.0.4—“by far the best modeling/rendering value around”) direct (800/846-0111) for \$249 (includes 30-day money-back guarantee). *Offer expires 12/31/93.*

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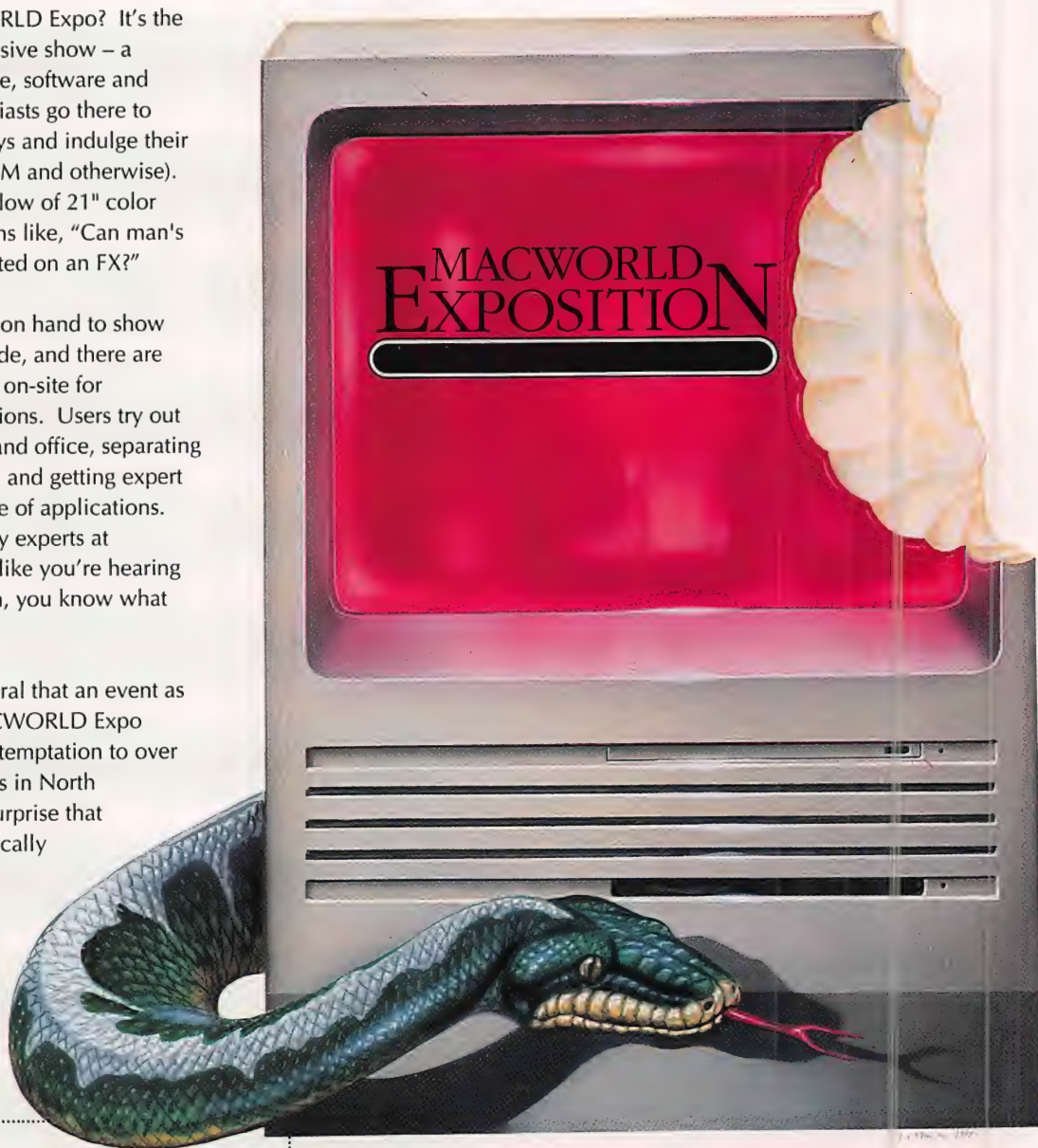
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Qualified Macheads are on hand to show users the tricks of the trade, and there are plenty of Macs provided on-site for impromptu practice sessions. Users try out new software for home and office, separating the quick from the dead, and getting expert critiques on a wide range of applications. In fact, there are so many experts at MACWORLD Expo, it's like you're hearing the word of G...(well, uh, you know what we mean).

In the end, it's only natural that an event as big and exciting as MACWORLD Expo would be an irresistible temptation to over 100,000 Mac enthusiasts in North America. (And it's no surprise that companies would practically part with their ribs to exhibit). True believers know that glory is never more than an upgrade (or two) away. And sticking with the same old program is almost a sin.



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03 ☐ 99 - 25
04 ☐ Under 25
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06 ☐ Mac Centris-series/II-series/LC III/Performa 600/450/SE 30
07 ☐ Mac LC/LC II/Performa 430/405/400/200/Classic-series/SE/Plus/512K/128K/Portable
08 ☐ Mac PowerBook-series/Duo-series
- C. What is the total number of Macs installed at this entire work-site? (Check one.)
- D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/or services? (Check one.)
- E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)
- F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)
- G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)
- H. What is your primary job function? (Check one.)
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14 ☐ None
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12 ☐ 49 - 10
13 ☐ 9 - 1
14 ☐ None
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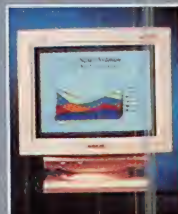


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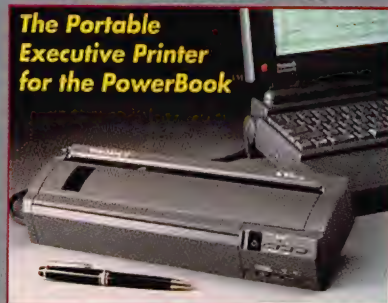
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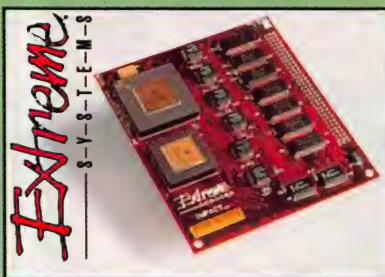
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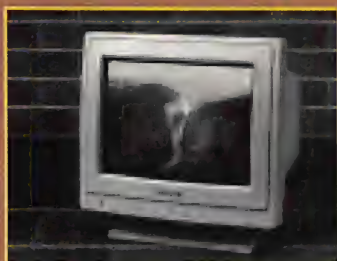
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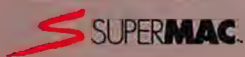
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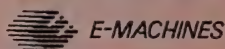


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2.4GIG	M2654	5.25" Full Height	11.5ms	2000mb	\$1629	\$1729

* One Year Warranty

Seagate



Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
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2.4GIG	ST12400N		9ms	2000mb	\$1699	\$1759
1.9GIG	ST11950N	Barracuda 1	8ms	1350mb	\$1599	\$1659
2.4GIG	ST12550N	Barracuda 2	8ms	2050mb	\$1949	\$2009
5.25" FULL HEIGHT						
1.6GIG	ST41651N	Wren-8	15ms	1350mb	\$1165	\$1265
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	\$1485	\$1585
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TWO YEAR WARRANTY

Maxtor



Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
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345mb	7345S	3.5" Low Profile	12ms	327mb	\$369	\$429
540mb	MXT-540	3.5" Low Profile	8.5ms	521mb	\$769	\$829
1240mb	MXT-1240	3.5" Half Height	8.5ms	1150mb	\$1215	\$1275

228 January 1994 MACWORLD

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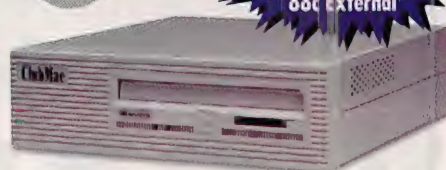
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600mb	Teac MT2ST/F50	CT600F	\$589	\$609

DAT TAPE BACKUP SYSTEMS

2.0GIG	Archive Python	4mm	\$959	\$979
3-5GIG	Archive Turbo DAT*	4mm	\$1189	\$1209
2.0GIG	Hewlett Packard 35470A	4mm	\$959	\$979
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CMO-DynaMo	Fujitsu	128mb	3.5" LP	35ms	\$869	\$929
CMO-M2511A	Fujitsu	128mb	3.5" LP	35ms		\$929
CMO-QMD5010	Epson	128mb	3.5" HH	45ms		\$849
CMO-JY750	Sharp	594/652mb	5.25" HH	40ms	\$1769	\$1799
CMO-C1716T	HP	1.3GIG	5.25" FH	24ms		\$2729
128mb / 600mb / 1.3GIG Cartridge						\$35/95/125

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.



E-Machines T16 II
• 640 x 480 up to 1024 x 768
• Comp. with on-board graphics on the Quadra and Centrals
MacUser Magazine
January 1993



E-MACHINES

E-MACHINES MONITORS

ColorPageT16II	\$1179
E-Machines E20 Dual Mode Color	\$1635
E-Machines T20 Multi-Mode Color	\$2495
E-MACHINES GRAPHIC CARDS	
24-Bit Futura SX / MX	\$355 / 799
24-Bit Futura II SX / LX	\$429 / 775
24-Bit Ultra LX	\$1089



\$2169
Thunder 24

MONITORS

SuperMac High Res 20	\$2749
SuperMatch 21"	\$2379
SuperMatch 20T Multimode XL	\$2539
SuperMatch Plus 20" Color	\$1649
SuperMatch 17T	\$1049

MULTIMEDIA

Video Spigot NuBus / Pro NuBus	\$369 / 999
Spigot & Sound NuBus / Pro NuBus	\$479 / 1099

SUPERMAC

24-BIT GRAPHIC CARDS

Thunder II Lite	\$2475
Thunder/24	\$2169
ThunderLight	\$1669
Spectrum/24 PDQ Plus / Series IV	\$1259 / 789
8-BIT GRAPHIC CARDS	
Thunder/8	\$1129
Spectrum 8*24 PDQ / PDQsi	\$499

ACCELERATORS

ThunderStorm / Deluxe / Pro	\$429 / 599 / 2399
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\$1799
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24-bit display card with video-in-a-window, frame capture and QuickTime full motion record and full screen playback. Combines two award-winning RasterOps products: 245TV and special version of the MoviePak daughtercard.

MONITORS

21" Color (2168)	\$2295
20"/20T Multiscan (2075R0)	\$2499
20/20 Multiscan Color (2020C)	\$1529
21" Mono/GrayScale (2110)	\$995
15" ClearVue/15 Portrait (1510)	\$399

RASTEROPS CORPORATION

DUOMATES

DuoMate 8	\$399
DuoMate 16sc	\$519

GRAPHIC CARDS

24Mx/24MxQ/24XL	\$599/1169/1869
PaintBoard Turbo XL	\$1469
PaintBoard Turbo / Li	\$1159 / 779
8XL / 8XL	\$899 / 459
ColorBoard 264/SE307S459	

MULTIMEDIA

MoviePak Presenter	\$1799
MoviePak / with Adobe Premiere	\$749 / 1129
MoviePak2	\$1549
MediaTime	\$1485
24XLTV / 24MXTV	\$2599 / 1639
245TV	\$745

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WORRY-FREE SERVICE WARRANTY

MONITORS

IntelliColor Display/20	\$2589
PrecisionColor Display/20v	\$1869
PrecisionColor Pivot	\$919
Mono. Pivot Display/E	\$565
Full Pg Display (FPD)	\$445
Two Pg Display 20G5	\$809
Two Pg Display 21G5	\$1055

GRAPHIC CARDS

PrecisionColor Pro 24X	\$1949
PrecisionColor Pro 24Xf	\$485
PrecisionColor 24X	\$1495
PrecisionColor 24XK	\$809
PrecisionColor 8XJ	\$485
Color Pivot/Pivot	\$489 / 249
FPD / Two Pg	\$189 / 375

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VideoVision Studio	\$3449
VideoVision Studio Upgrade	\$1599
VideoVision (Presentation)	\$1929
VideoVision (Basic)	\$1615
Rocket 25i / 33	\$979 / 1449
RocketShare	\$399
PhotoBooster	\$799

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10THUB/12	10BT Hub w/12 10T, Thk & Thin ports	\$479
10THUB/8	10BT Hub w/8 10T, Thin port	\$239
Mini EN/SC	Thin/10BT SCSI Ether w/DT & PB cable	\$297
Mini EN/SC10T	10T SCSI Ethernet w/DT & PB cable	\$239
FN10TA	10T FriendlyNet Media Adapter	\$65
FN1MA	Thin FriendlyNet Media Adapter	\$65
MC+11E64	Mac II & Perf 600, Thk/Thin, 64K	\$145
MAC+11E764	Mac II & Perf 600, Thk, 10BT, 64K	\$145
MC3NB	Mac II & Perf 600, Thk/Thin/10BT, 64K	\$189
AP1001	AsantéPrint, Thk/10BT or Thk/Thin	\$239

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StarNet 3 in 1 Card-NuBus, PDS, SE	\$149
StarNet Thk/Thin for NuBus, PDS, SE	\$99
StarNet Thk/10BT for NuBus, PDS, SE	\$99
StarNet MicroSCSI Thin/10BT SCSI Ether	\$249
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(Quadras, Centrals, Laserwriters, WorkGroup Servers)	
Single Port 10BT or Thin	\$69
Dual Port 10BT and Thin	\$99
StarNet MAUI Products	\$119
(Allows connection of two of the following products to one ethernet port, comp. with Quadras, Centrals, Laserwriters, WorkGroup Servers)	

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15" MultiSync 4FGe	\$719
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17" MultiSync 5FGp	\$1399
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MacFG 24X/24Xp	\$1199/479

DUAL SPEED CD-ROM READERS

MultiSpin 74-1 (280ms access time)	\$399	\$499
MultiSpin 84 (480ms access time)	\$269	\$369

TRIPLE SPEED CD-ROM READERS

MultiSpin 3Xe (External, 195ms access time)	\$579	\$679
MultiSpin 3Xi (Internal, 195ms access time)	\$489	\$589
MultiSpin 3Xp (Portable, 250ms access time)	\$449	\$549

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Silentwriter 97	\$1119
Silentwriter 95fx	\$1349
Silentwriter 97fx	\$1429

CLUBMAC CD BUNDLE OVER \$800 VALUE

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- U.S. Atlas
- World Atlas
- Mayo Clinic
- Lucas Game Pack II
- The Animals
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MODEMS



\$229

GLOBAL VILLAGE POWERPORT (for PowerBooks)

Bronze / Silver / Gold	\$165 / 255 / 285
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GLOBAL VILLAGE TELEPORT (External Desktop)

Bronze / Silver / Gold	\$105 / 255 / 285
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SUPRA MODEMS

SupraFamModem 14.4 LC V.32bis, V.42bis w/FAXstf & Micro	\$165
SupraFamModem 14.4 V.32bis, V.42bis Standalone	\$209
SupraFamModem 14.4 V.32bis, V.42bis w/FAXstf & Micro	\$235
SupraFamModem PB 14.4 V.32bis, V.42 Internal for PB	\$279
Supra 2400 Baud External Modem	\$69

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DAYSTAR DIGITAL



33 MHz PowerCache	\$335	\$415
40 MHz PowerCache	\$499	\$585
50 MHz PowerCache	\$565	\$665
PowerCache Adapter	\$99	
Required for non-Mac IIcx, IIfx, IIfx, Performa 600		
PowerCache Adapter (Classic/SE)	\$125	
PowerCache Adapter	\$415	
Video for Mac Classic or SE		

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20 MHz Turbo 040i	\$589
25 MHz Turbo 040i	\$665
33 MHz Turbo 040i	\$749
TURBO 040	
25 MHz Turbo 040	\$839
33 MHz Turbo 040	\$999
40 MHz Turbo 040	\$1249
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340MB	12ms	\$329	\$389
525MB	10ms	\$589	\$649
PRO Series			
700MB	10ms	\$779	\$839
1.0GB	10ms	\$909	\$969
1.2GB	10ms	\$1066	\$1126
1.8GB	10ms	\$1270	\$1330
GO-Series			
80/85MB	17ms	\$191/219	\$251/279
120/127MB	17ms	\$268/259	\$328/319
160/170MB	17ms	\$259/289	\$319/349
256MB	17ms	\$368	\$428

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SyQuest, Fujitsu, Micropolis, Maxtor drives also available.
Please call for a competitive quote.

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Fujitsu	128MB	35ms	\$899	\$929
Fujitsu	128MB	45ms	\$769	\$799

EXTERNAL DRIVE ENCLOSURES

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Dataproducts LZR 960

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Envio NDA 030 4 MB P/B Adapter

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Terra Multisync 14" Monitor

\$339

- Multisync tube
- Multiple resolution up to 1024 X 768
- PC and Macintosh compatible



DuoMate 16sc	\$543
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2075RO	\$2489
PaintBoard Li	\$799
PaintBoard Turbo	\$1109
24STV	\$739
Media Time	\$1479



Winner
October 1993

Ergo-View 17 \$1069

Ergo-View 14	\$399
Power Portrait	\$549
Movie Movie	\$299



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33MHz PowerCache	\$335 ...	\$419
40MHz PowerCache	\$499 ...	\$585
50MHz PowerCache	\$625 ...	\$735
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33MHz Turbo 040i/040	\$792 ...	\$1085
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w/FPU w/cache

1300 Series - for SE

25MHz	\$199 ...	\$299
40MHz	\$289 ...	\$379 ... \$99

2300 Series - for Classic

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40MHz	\$289 ...	\$379 ... \$99

4300 Series - for LC, LC II, Performa 400 & Color Classic

40MHz	\$379	\$505
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6400 Series - for IIsi, Ilic, Ilii, Ilii, Ilii & Performa 600

25MHz	\$769
33MHz	\$919
40MHz	\$1109
DataLink PB	\$469
Plus Drive	\$299



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UC630 LE/Full	300 x 600 res.	\$789/959
UC840	400 x 800 res.	\$1248

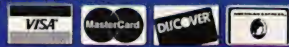
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Microsoft Office is a great deal – the full versions of the latest Microsoft Word, Excel, PowerPoint, and Mail for over \$1,000 less than if you had purchased them separately. And they were all designed to work great together.

Microsoft Works is an integrated software package with a word processor, database, spreadsheet, charting, drawing, and communications – all bundled into one. The TrueType font bundle includes over 100 TrueType fonts. (\$99.95 value) Hurry! Rebate offers end 1/31/94.

Minimum requirements: MS Office – Mac Plus, 2MB RAM, System 6.0.5, a hard disk. MS Works – MacPlus, 1MB RAM, System 6.0.5, a hard disk.

Microsoft

5645 Microsoft Office 3.0 (pictured)

5688 Microsoft Office 3.0 CD-ROM \$338.*

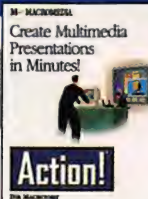
7192 Microsoft Works 3.0 TrueType Bundle (pictured)

5068 Microsoft Works 3.0 \$99.*

* After \$100 rebate on Microsoft Office and \$50 rebate on Microsoft Works.

Microsoft Works/TrueType Bundle offer good while supplies last.

\$399.



TVator Pro & Action! Bundle

Turn any Mac or PC into a powerful multimedia presentation system. The TVator Pro is a small, lightweight, portable device that converts analog RGB/VGA to NTSC signals for flicker-free color output on big screen TV, RGB video, LCD projectors, and RGB/SVGA monitors. It includes cables, power adapter, utility disk, TV brightness controller, and user's manual. Macromedia's Action! Bundle is all you need to create professional-quality, high-impact business presentations. It includes Action! multimedia presentation software, SoundEdit Pro, and Perfect Presentations ClipMedia 3. Action! is a revolutionary application that lets you create dazzling multimedia presentations with sound, motion, text, graphics, animation, video, and interactivity.

Minimum requirements: TVator Pro – LC II; LC III; Ilvix; Ilvix; Centris 610, 650; Quadra 700, 800, 900, 950; PowerBook 160, 165c, 180, 180c; TV with Composite Video or S-Video input. Action! Bundle – Mac IIci, 4MB RAM, System 7, color monitor, CD-ROM drive.

Antec

7150 TVator Pro & Action! Bundle

\$224.



SupraFAXModem V.32bis MacPac

"The SupraFAXModem V.32bis is an excellent value," raves Tom Negrino of Macworld. It features 14,400 bps data and fax communications with up to 57,600 bps throughput using V.42bis data compression. The modem automatically negotiates the fastest connection, and sending a fax is as easy as printing. You can even delay transmission until times when long-distance rates are lower. The Silent Answer feature detects if an incoming call is fax or voice, and handles it appropriately. The MacPac includes cables, FaxMania, and WorldLink, FREE. FaxMania is a collection of fun cover sheets, and WorldLink lets you connect to the Internet.

Supra Corporation

4017 SupraFAXModem V.32bis MacPac

6651 SupraFAXModem 144 LC \$168.00

5575 SupraFAXModem 144 PB \$298.00

\$36.

The Illustrated Personal Organizer

This address book, daily planner, screen saver, and personal daily journal gives you information, entertainment, and wisdom. Discover the history of each day from the perspectives of different subjects, beliefs, and customs. Enjoy the incredible "Living Worlds" artwork created by Mark Ferrari.

Minimum requirements: 2MB available RAM, System 6.0.5, color monitor with at least 640x480 resolution, 7MB available hard drive space, 1.44MB floppy drive.

Seize The Day

6764 Seize The Day: The Illustrated Personal Organizer for Mac

6771 Seize The Day: The Illustrated Personal Organizer for Windows ..\$36.

\$198.



Arrange & Connectix Desktop Utilities Bundle

Now, in one bundle, get the ultimate Personal Information Manager (PIM) and a set of essential utilities for your Mac. **Arrange** is a fully integrated PIM that lets you organize contacts, schedules, to-do lists, projects, files, notes and much more. It's completely customizable for totally personal solutions. A powerful "drag-and-drop" interface, intelligent importing, and automatic merging and sorting make it quick and easy to use. And **Connectix Desktop Utilities** has a slew of handy functions. Set your Mac to automatically shut down, saving power. Add function and cursor keys without an extended keyboard. Preserve the life of your monitor with a screen saving dimmer, and much, much more.

Minimum requirements: Mac II, 1.5MB available RAM, System 6.0.7, 3MB hard disk space.

Common Knowledge

7216 Arrange & Connectix Desktop Utilities Bundle

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And always at a great price! Our custom database lets us manage our vast inventory with precision. So if it's available from the manufacturer, we've got it in stock – just a day away from your door.

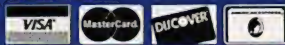
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ReadySetGrow!

Waaaa! Why didn't someone come up with this sooner? It's a fun, interactive guide for expecting parents that covers all facets of pregnancy and early childhood. Animation, illustrations, sound effects, and text combine to create a thorough reference.

ReadySetGrow! also includes sections for a family profile, medical records, calendar, and address book to record the history of your child's beginnings.

Minimum requirements: Any Mac with 1MB RAM (2MB RAM recommended), System 6.0.5, a hard drive.

Atlantis

6991 ReadySetGrow!

6992 ReadySetGrow! Windows ..\$41.



Mangia!

Draft your Mac into KP duty. Mangia! includes hundreds of recipes and you can add your own. Find recipes you can cook with the ingredients on hand.

Zero in on recipes for their kid appeal, spiciness, and more. Choose a recipe, then easily adjust the ingredients for the number of servings you need. Plan a menu for a week, and Mangia! writes the shopping list for you.

Minimum requirements: Any Mac with 1MB RAM, System 6.0.5.

Upstill Software

6901 Mangia!



SkyGazer

This is the ideal companion for anyone first exploring the wonders of the night sky. SkyGazer shows the heavens on your computer screen - complete with planets, galaxies, and even shooting stars. Learn the names of the bright stars. Travel to each of the planets. Colorful animation illustrates common astronomical concepts. Designed for ages 9 and up.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5, 3MB hard drive space.

Carina Software

7169 SkyGazer



A Zillion Kajillion Rhymes

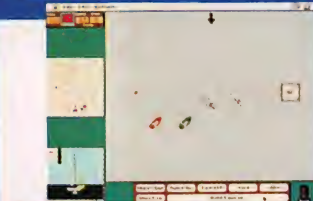
"Turns your Mac into a killer rhyming dictionary... I recommend it unreservedly..." says James Bradbury of MacUser. A Zillion Kajillion Rhymes is great fun for the poet in all of us. Not a poet? You will be. Use it for birthday cards, flyers, songs, anything that needs a little fun. Just type a word and click. Kids will love using it to make up their own rhyming stories.

Minimum requirements: Mac Plus, 200K RAM, System 6.0.5. (System 7 savvy)

Eccentric Software

6438 A Zillion Kajillion Rhymes

6915 A Zillion Kajillion Rhymes Windows\$32.



\$39. Sailing Master

Don your sailing cap and deck shoes as you race against your Mac and learn how to sail without getting wet. Sail against as many as three boats, and learn about wind shifts. Course options, skill levels, hazards, and other features offer a challenge for land lubbers and old salts alike. "Sailing Master is a lot of fun - well worth the price," says Macworld. (Nov. '93)

Minimum requirements: Mac 512K.

Starboard Software

5318 Sailing Master



\$31. Crystal Caliburn

Any Pinball Wizard will "flip" for Crystal Caliburn! Your quest for knighthood is full of surprises and great scoring opportunities. Accolade all twelve knights and then go for the Holy Grail. And Crystal Caliburn includes advanced pinball action like nudge, tilt, battle sounds, 3D ramps, three multiball, flashing bumpers, and more.

Minimum requirements: Any color Mac w/13" or larger monitor, 4MB RAM, System 6.0.7.

StarPlay Productions Inc.

7080 Crystal Caliburn



\$39. Flight Commander

"Check Six... break left!" Flight Commander brings a new approach to air-combat wargaming on your Mac. You lead a whole squadron of jet aircraft with your commands. Test your tactical skills in missions ranging from combat air patrol to long-range precision strikes. Or create battles of your own. You must choose the right pilots, aircraft, and weapons to accomplish the mission objectives.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5.

Big Time Software

6962 Flight Commander



\$36. Eric's Ultimate Solitaire

Eric's Ultimate Solitaire is a terrific collection of solitaire card games. They include Klondike, Baker's Dozen, Black Hole, Forty Thieves, Montana, Golf, Spider, Eight Off, Towers, Yukon, Calculation, Poker Square, and many others. Spectacular graphics and animation make these games extra fun to play.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5

Delta Tao Software, Inc.

7187 Eric's Ultimate Solitaire



\$38. DinoPark Tycoon

This is sure to become a Jurassic Classic with every young entrepreneur. Use math, economics, business, and science skills to build your dinosaur theme park from the ground up. Kids learn the challenges, responsibilities, and fun of running their own business. DinoPark Tycoon also comes with a fact-filled guide to dinosaurs.

Minimum requirements: System 6.0.7 and 1MB RAM for monochrome, 4MB for color.

MECC

7015 DinoPark Tycoon

(For ages 8 to adult)



\$59. Mammals - A Multimedia Encyclopedia

More than 200 mammals come to life on this multimedia CD-ROM from National Geographic. Captivating video and sound clips, and over 700 photographs keep the learning fun, while the equivalent of 600 pages of related text and vital statistics make this CD-ROM as informative as it is entertaining.

Minimum requirements: 4MB RAM, System 6.0.8, color or gray-scale monitor, CD-ROM drive.

National Geographic

7000 Mammals - A Multimedia Encyclopedia

MAC'S PLACE FEATURED BUNDLE

\$39. Pathways into Darkness & Official Hint Book Bundle

Think fast! You'll have to if you're going to keep up with continuous-motion, 3D, texture-mapped graphics and defeat an alien demon. Separated from your secret special forces team, you embark on your mission to save the world, alone. You'll need your wits, not just firepower, to get by many of the obstacles. Explore miles of catacombs through a smooth-scrolling, first-person interface. Beautifully rendered graphics and active panning stereo sound combine to make Pathways Into Darkness the closest thing to virtual reality without a helmet. The 60-page hint book is your guide to all of Pathways' levels, monsters, items, strategies, and tips. No stone is left unturned! You get all the maps and a level-by-level walk through.

Minimum requirements: Any 256 or 8-bit color Mac, 2MB RAM, System 6.0.5, 5MB hard disk space.

Bungie Software

7186 Pathways into Darkness & Official Hint Book Bundle

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Greg LeMond's Bicycle Adventure

Journey around the world with Greg LeMond in this interactive reference devoted entirely to cycling history, racing, touring, and more. Every trip is a different experience. Experience the role of bicycling in other societies; travel through time to see Leonardo de Vinci's sketches of the first bicycle; or watch Greg LeMond race! There are hundreds of interactive screens covering diverse topics such as mountain biking, environmental impact, people, and equipment. Read both fact and fiction while losing yourself in the vibrant images, exciting video, and sensational sound of Greg LeMond's Bicycle Adventure.

Minimum requirements: LC II, 5MB RAM, System 7.0, 13" color monitor.

Eden Interactive

- 6921 Greg LeMond's Bicycle Adventure (pictured)
- 6922 Greg LeMond's Bicycle Adventure CD-ROM \$48.
- 6923 Golf Who What When Where \$48.

From \$16.



Gametek Games

The ground forces are relying on you for protection, so swallow hard and pilot **Valkyrie** into battle. This 3D helicopter flight simulator gives you 10 tense missions to test your courage and skill. Select any of seven camera angles for the most strategic view. Then home in for the kill using your joystick or a mouse. Get ready for 25 levels of fast arcade action in **MacAttack**. This 3D shoot 'em up provides hours and hours of fun. Use your laser, smart bombs, or other special weapons to finish off your targets and complete each increasingly-difficult level.

Minimum requirements: Valkyrie - 4MB RAM, System 6, 256 colors. MacAttack - 2MB RAM, System 6, 256 colors.

Gametek

- 7208 Valkyrie \$27.
- 7209 MacAttack \$16.
- 5942 Bill Elliot NASCAR Challenge \$28.
- 6513 Jeopardy \$24.
- 6508 Wheel of Fortune \$24.
- 6033 Journeyman Project \$55.



\$178.

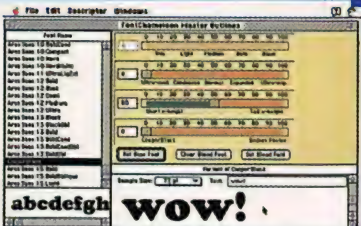
FontChameleon

FontChameleon gives you a type library of over 200 of the most popular text fonts and the ability to create literally millions of new fonts just by moving slider bars. You can create fonts in Postscript Type 1 (for ATM support) or TrueType formats for the Mac or Microsoft Windows. Each font you create is fully hinted, so the font will have the hand-crafted quality of an original design. FontChameleon's revolutionary technology allows you to alter the preset designs by "blending." For example, you can blend Franklin Gothic and Bookman to create a new design. Each font's X-height, condense/extend, and boldness can be automatically altered with easy-to-use slider controls.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.7., a hard disk.

Ares

- 6766 FontChameleon (pictured)
- 6765 FontHopper \$41.
- 5673 FontMonger \$96.



MAC'S PLACE EXCLUSIVE BUNDLE

\$78.



PowerBook Thunder Bundle

You won't find a better bundle for your PowerBook, or a better value. And this bundle is only available by mail through Mac's Place. **Thunder 7 1.5** is an interactive spell-checker, dictionary, and thesaurus Desk Accessory. It works in most applications like word processors and databases. **DayMaker Organizer 3.0** gets you organized handling calendars, to-do lists, contacts, and phone-call management. With **Magnet** you get all the functions of a backup program, find file utility, file manager, and file synchronizer in one program. **Connectix PowerBook Utilities (CPU)** is the award-winning solution for maximizing PowerBook battery life and increasing productivity.

Minimum requirements: Thunder 7 - Mac Plus, 1MB RAM, System 6.0.3. DayMaker - Mac Plus, 2.5MB RAM, System 6.0.5, hard drive. Magnet - System 7. CPU - PB 100, 2MB RAM, System 7.

Baseline Publishing

7217 PowerBook Thunder Bundle

\$489.

Painter 2.0 & ArtZ Tablet Bundle



Fractal Design's **Painter 2.0** is the most innovative and exciting paint and photo-design program on the market. And Wacom has long been recognized as the premiere tablet maker. The **ArtZ 6x8 ADB Tablet** is the latest in a distinguished line. Painter 2.0 is a remarkable 24-bit color paint program that simulates the tools and textures of natural media. New tools include a spatter airbrush, Cubist effect, and multiple light sources. It's also a photo-design program with photo compositing and color separation. The ArtZ tablet is an amazing graphical input device. On it you use the stylus as if it were a pen or brush on your screen. The stylus is cordless, batteryless, and detects 120 levels of pressure.

Minimum requirements: ArtZ ADB Tablet - Mac SE, System 6.0. Painter 2.0 - Mac SE/30, 2.5 MB RAM, System 6.0.5.

Wacom Technology/Fractal Design Corp.

5355/5657 Painter 2.0 & ArtZ ADB Tablet Bundle

\$324.



Elastic Reality



Hollywood professionals call Elastic Reality the most powerful and complete Macintosh morphing product available. And it's a completely shape-based morphing and warping system. There are no cumbersome meshes, points, or vectors to get in your way. Instead, you create morphing effects the same way you think about them - by manipulating shapes and colors. Features include regional motion and fade control, re-usable shapes, wireframe preview for motion testing, resolution independence, and full-motion warp support with automatic "tweening." Now you can own this professional-effects package at a special introductory price. It includes a tutorial video. **MacUser** gives Elastic Reality a 4-mice rating.

Minimum requirements: FPU-equipped Mac & color QuickDraw, 8MB RAM, 8-bit monitor, System 7.0.1, QuickTime 1.5, hard drive.

ASDG

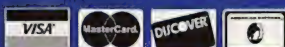
7084 Elastic Reality

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6684 PB Duo Battery



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Newer Technology
6904 SCSI MicroDock



\$558.

Bernoulli MacTransportable Multidisk 150

Enjoy all the benefits of a Bernoulli with the flexibility to read and write to disks of many capacities - 35MB, 65MB, 105MB, and 150MB. And the Multidisk 150 is downward compatible so it reads and writes to 90MB disks and reads 44MB disks. You get unlimited storage expandability, lock-away security, and transportability. The patented Bernoulli design resists head crashes and the sturdy disks can survive a drop of eight feet! This Bernoulli is internally terminated with a single external SCSI connector, so it must be installed as the last device on your SCSI chain.

IOmega
5609 Bernoulli MacTransportable Multidisk 150



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Minimum requirements: CV Link Scan Converter - Mac LC, LCII, LCIII, Performas, IIfx, Centris's, Quadras, PowerBooks with video out.

Display Tech, Inc.

6877 CV Link Scan Converter w/Action!\$559.
6875 Mac DisplayLink w/Action!\$374.



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Minimum requirements: LC, 4MB RAM, System 7, Color QuickDraw.

Bit Jugglers

6931 UnderWare



\$39.

Square One

Square One stores all of your favorite files in an easy-to-use icon palette. To access a file, just double click on its icon. Group several files into a single work-group icon and open them all at once. No more time wasted rummaging through your hard drive, and no goofy hierarchical menus. Just point and click with Square One.

Minimum requirements: Mac Plus, 2MB RAM, System 7.

Binary Software

7027 Square One

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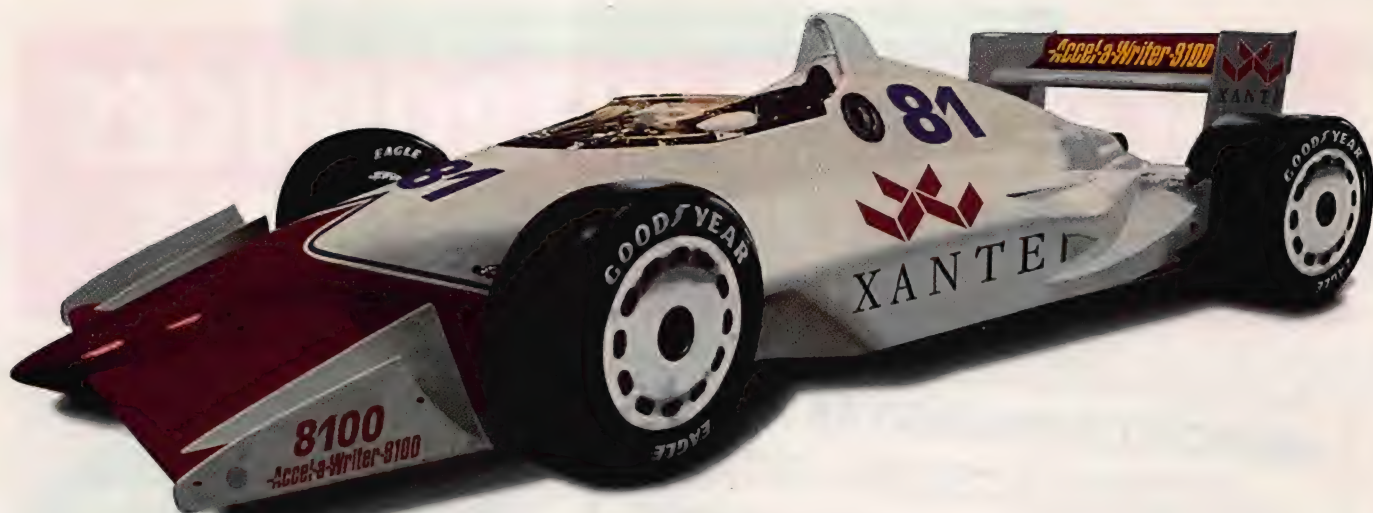
Minimum requirements: Mac II, 3MB RAM, System 7, a hard disk.

VideoFusion

6784 QuickFLIX

5165 VideoFusion\$448.





"Zero to 100 in 4½ Seconds,...

U.S. MOTORSPORTS

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Mobile, AL 36606

Dear Xante:

As owner of a race car marketing company, I have been using your Accel-a-Writer products, problem free, for over two years now. I purchased your 8100 imagesetter with 1200 dpi output and it always goes to the races with my staff to produce on-the-fly printing of press updates, badges, award certificates, newsletters, you name it.

Recently, I had a need to print a small run of 11" x 17" folded newsletters with several black & white photos at 133 lpi. The results were phenomenal! Zero to 100 in 4 1/2 seconds! Fastest high quality output I have ever seen, like an Indy car, Xante's Accel-a-Writer 8100 is designed to win races.

I plan to get a local printer to print a year's supply of color headers with our 11" x 17" paper stock. This way I can pull a quantity for each race and print the finished black plate on our 8100 for quick turnaround time in distributing a four page newsletter.

Oh, by the way, Parnelli Jones has a couple of sons ready to win you more races at better than zero to 100 in 4 1/2 seconds.

Thank you, Jim Joiner



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*Ethernet, supporting EtherTalk protocol, is optional



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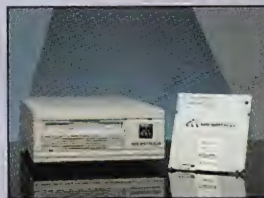
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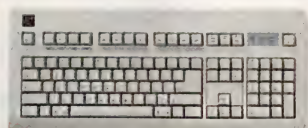
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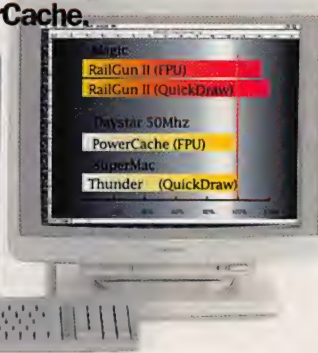
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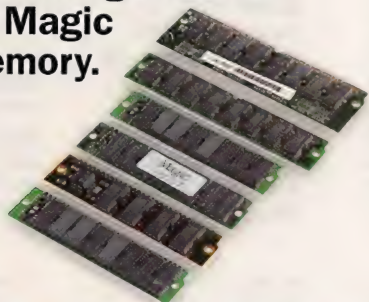
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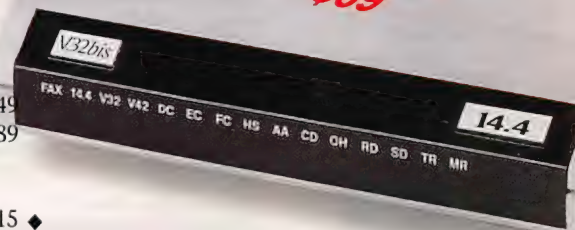
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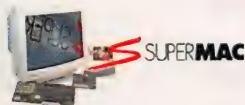
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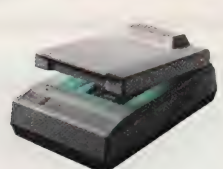
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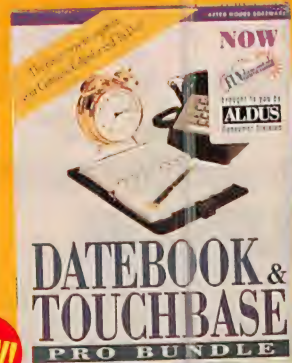
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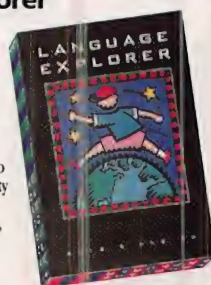
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DAT0047 Microsoft FoxBASE+/Mac 2.01 329.95
BUS0181 Microsoft Project 3.0 445.
BUS0186 Microsoft Schedule+ 5 Pack 135.
BUS0285 The Microsoft Office 3.0 475.
BUS0269 PowerPoint 3.0 295.
WAD0059 Word 5.1 295.

Pastel Development

BUS0266 Daymaker 2.0 79.

Round Lake Publishing

Business, Legal or Sales LetterWorks ea. 45.

Teleware, Inc.

WIN0087 M.Y.O.B. 3.0 109.

Wordstar

WAD0060 WriteNow Workshop 85.

WordPerfect Corporation

WAD0068 WordPerfect 3.0 w/ FREE Grammatik 299.95

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Adobe

COM0171 Adobe Acrobat Starter Kit 669.

Apple Computer, Inc.

NET0250 AppleShare 3.0.1 969.
COM0131 AppleTalk Remote Access 149.
COM0126 Macintosh PC Exchange 59.95

Dayna Communications, Inc.

NET0357 EtherPrint-3 379.
NET0077 DaynaPORT E/I 149.

Thunder 7 v.1.5.3



Thunder 7 is the universal spellchecker that alerts you the instant you make a mistake, helping you fix it immediately—in any application. With features such as

Shorthand Glossary which expands abbreviations automatically as you type and an on-line thesaurus, you keep your work looking professional. You'll find it indispensable!

Publisher:
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SPI0029

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Make your PageMaker and Quark XPress documents instantly come alive with photos. Only PhotoFlash software gives you everything needed to easily acquire, adjust, and place photographic images fast, even if you're a first time user. Perfect for Macintosh desktop publishers and page layout users.

Publisher: Apple Computer, Inc.
DTP0108



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Global Village (full line available)
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Card Collector 2.0

State-of-the-art software for baseball card collectors. Tracks cards, what they're worth, and what you need to complete sets. Features flexible organization, easy updating, quick searches, full report capabilities, and more! Plus, complete card data from 1948 to present for all popular sets!

Publisher:
AbleSoft, Inc.
ENT0557



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MOD0128 ACCURA 2400 (data only) 75.95
Inspira (Full line available)
UT01433 AccessPC 3.0 79.95
COM0144 Soft PC Universal 3.0 89.95
PowerUser®
MOD0115 24/96 Send/Receive Fax Modem 129.95
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MOD0117 FXV FaxModem 119.

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GRA0268 Kid Pix 1.2 35.
Centron Software, Inc.
ENT0289 CasinoMaster Deluxe Color Version 45.
ENT0440 Crossword Creator 39.
Nordic Software
EDU0051 MacKids Turbo Math Facts 2.0 25.
Personal Training Sys. (Full line available)
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MUS0092 Miracle Piano 349.

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DTP0088 PageMaker 5.0 579.95
UPG0032 PageMaker 5.0 Upgrade 149.

DTP0080 Personal Press 2.0 99.
Altsys
FON0509 Fontographer 4.0 259.
Apple Computer, Inc.
GRA0347 QuickTime Starter Kit 109.
Claris
GRA0350 MacDraw Pro 1.5 269.95
Electronics for Imaging (EFI)
GRA0432 Cachet 299.
Dream Maker
GRA0514 MacGallery II 27.
Fractal Design
GRA0412 Painter 2.0 279.
Graphsoft
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CAD0030 MiniCad+4.0 499.95
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GRA0505 Morph 2.0 159.95
Kodak
GRA0443 Kodak Shoebox 279.
Quark, Inc.
DTP0096 XPress 3.2 599.
Ray Dream
GRA0383 addDepth 125.
Softkey Software
FON0480 KeyFonts 49.

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Apple Computer, Inc.
ACC0921 LaserWriter Toner Cartridge 89.95
ACC0922 LaserWriter 250 Sheet Letter Cassette 72.95
ACC0923 LaserWriter II Letter Cassette 65.95
Caere
INF0289 OmniScan 399.
Datadesk International
INP0174 Mac 101E Keyboard Platinum 129.95
INP0183 Mac 101E w/Keys 2 159.
Kensington
INF0231 Turbo Mouse (SE or II) 4.0 109.
Microtek
INF0246 Microtek ScanMaker II 899.
INF0247 ScanMaker II XE 1199.
Mouse Systems
INF0132 Little Mouse ADB 74.

Typstry

Pixar Typstry is exciting software which creates dimensional text from Type 1 and TrueType fonts. Move, rotate, scale and extrude words or individual letters and decorate fonts in any number of interesting appearances. Create images for logos, publishing, design, presentation graphics or multimedia. Typstry makes RenderMan magic to transform a simple word into an extraordinary picture.

Publisher:
Pixar
FON0482



\$189

SuperMac
MON0053 SuperMatch 20+ Color Display 1799.
UMAX
INP0273 UC840 Color Scanner w/ Photoshop 1445.
INP0287 UC630 Color Scanner w/ Photoshop LE 899.

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ACC0834 Battery Charger 69.
Battery Technology Inc.
ACC0840 Battery for Powerbook 59.95

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GameCheater is a control panel device that allows you to cheat at dozens of Mac games. Be undefeatable! Conquer every adversary, every time! GameCheater works with all your favorites including

Prince of Persia, Hellcats over the Pacific and Spectre. Get GameCheater and you'll be invincible. Publisher: Baseline Publishing
ENT0556

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UTI0297 CPU Connectix for Powerbook Utilities 55.95
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INP0221 Notebook Keypad 79.
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Universal PowerCache 33 MHz w/882 459.95
Universal PowerCache 40 MHz 539.95
Universal PowerCache 40 MHz w/882 639.95

Mass MicroSystems
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DRI0623 Data Pak 44/88C MB Removable 649.95

Peripheral Land, Inc.
DRI0375 Infinity 88 Removable single 589.95
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CHP0013 1 Meg SIMMs 100ns Call.
DRI0550 85 Meg Drive 329.95
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BND0094 44MB Syquest Removable 299.
BND0095 88MB Syquest Removable 489.

SuperMac Technologies
DRI0437 Spectrum/8.24 PDQ 599.

Utilities & Programming
Abbott Systems, Inc.
UTI0113 CanOpen 2 59.95
Aladdin Systems
UTI0302 Shuffl Deluxe 3.0 69.
Apple Computer, Inc.
SYS0004 System 7.1 Personal Upgrade Kit 59.95
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UTI0293 OmniPage Direct 199.95
UTI0202 OmniPage Professional 499.95

Kent Marsh, Ltd.
UTI0212 FolderBolt 75.
MAXA Corporation
UTI0353 Alert! 115.

MicroMat Computer Systems
UTI0285 MacCKG 2.0 89.
Symantec Corporation
UTI0151 Norton Utilities for the Mac 2.0 95.
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CAPACITY	DESCRIPTION	INTERNAL	EXTERNAL
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1200MB	3.5" HH 9ms	\$939	\$999
2000MB	5.25" FH 14ms	\$1,629	\$1,729
2400MB	5.25" FH 11.5ms	\$1,639	\$1,739

Fujitsu Drives carry a 5 year warranty

Quantum

CAPACITY	DESCRIPTION	INTERNAL	EXTERNAL
80MB	2.5" Notebook 17ms	\$187	\$287
120MB	2.5" Notebook 17ms	\$255	\$355
160MB	2.5" Notebook 17ms	\$260	\$360
42MB	3.5" LP 19ms	\$99	\$159
85MB	3.5" LP 17ms	\$155	\$215
127MB	3.5" LP 17ms	\$175	\$235
170MB	3.5" LP 17ms	\$180	\$240
240MB	3.5" LP 10ms	\$245	\$305
525MB	3.5" LP 10ms	\$585	\$645
700MB	3.5" HH 10ms	\$745	\$805
1000MB	3.5" HH 10ms	\$895	\$955
1200MB	3.5" HH 10ms	\$995	\$1,055
1800MB	3.5" HH 10ms	\$1,235	\$1,295

Go Drives carry a 1 year warranty / The rest carry a 2 year warranty

Seagate

CAPACITY	DESCRIPTION	INTERNAL	EXTERNAL
1200MB	3.5" HH 10.5ms	\$915	\$975
2100MB	5.25" FH 12.9ms	\$1,430	\$1,530
2100MB	3.5" HH 8ms	\$1,935	\$1,995
1600MB	5.25" FH 11.5ms	\$1,135	\$1,235
2400MB	5.25" FH 11ms	\$1,715	\$1,815
3400MB	5.25" FH 11ms	\$2,150	\$2,250

Seagate Drives carry a 1 year warranty

Maxtor

CAPACITY	DESCRIPTION	INTERNAL	EXTERNAL
120MB	3.5" LP 15ms	\$194	\$254
245MB	3.5" LP 15ms	\$245	\$305
345MB	3.5" HH 15ms	\$345	\$405
540MB	3.5" HH 8.5ms	\$699	\$759
1200MB	3.5" HH 8.5ms	\$1,189	\$1,249
1700MB	5.25" FH 13ms	\$1,229	\$1,339

Maxtor 3.5" Drives carry a 1 year warranty
5.25" Drives carry a 2 year warranty

SYSTEMS



MODEL	DESCRIPTION	PRICE
Q950 8/245	17" Monitor, X Keyboard	\$4,189
Q950 8/245	14" Monitor, X Keyboard	\$3,969
Q840AV 8/230	17" Monitor, X Keyboard	\$4,149
Q840AV 8/230	14" Monitor, X Keyboard	\$3,859
Q840AV 8/230-CD	17" Monitor, X Keyboard	\$4,529
Q840AV 8/230-CD	14" Monitor, X Keyboard	\$4,249
C660AV 8/230	17" Monitor, X Keyboard	\$2,929
C660AV 8/230	14" Monitor, X Keyboard	\$2,659
C660AV 8/230-CD	17" Monitor, X Keyboard	\$3,179
C660AV 8/230-CD	14" Monitor, X Keyboard	\$2,639
Q650 8/230	14" Monitor, X Keyboard	SCALL

DESKTOP SCANNERS



MODEL	DESCRIPTION	PRICE
MICROTEK		
Microtek ScanMaker II	24-bit Color, 600x300 dpi	\$875
Microtek ScanMaker IIx	24-bit Color, 600x300 dpi	\$1,149
Microtek ADF	For 600/Scanmaker II	\$489
Transparency Adapter	For Scanmaker II/IIx	\$599
UMAX		
UMAX UC630	24-bit Color, 600x300 dpi	\$1,089
UMAX UC840	24-bit Color, 800x400 dpi	\$1,279
UMAX UC1260	24-bit Color, 1200x600 dpi	\$1,879
Transparency Adapter	For All Models	\$689

3.5" OPTICAL DRIVES



MODEL	CAPACITY	SEEK	MacKit
TEAC	128mb	35ms	\$689
Fujitsu-128	128mb	30ms	\$899
Sony-P301	128mb	35ms	\$1,149
Most-256	128/256mb	37ms	\$1,399

Includes external drive, 25/50 SCSI Cable, Mac SW, and Terminator

CARTRIDGES

Sony 128mb as LOW as	\$45
Komag 128mb as LOW as	\$33

SYQUEST DRIVES



MODEL	INTERNAL	EXTERNAL
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SyQuest 88C	\$309	\$369
SyQuest 44	\$199	\$239
DUAL DRIVES		
SyQuest 88/44	N/A	\$678
SyQuest 88/88	N/A	\$699
SyQuest 44/44	N/A	\$569

CARTRIDGES

105MB Cartridges (5+ or with drive Purchase)	\$59.99
88MB Cartridges (5+ or with drive Purchase)	\$89.99
44MB Cartridges (5+ or with drive Purchase)	\$59.99

CD-ROM DRIVES



MODEL	DESCRIPTION	MacKit
Toshiba 3401	Multi Session/Dual Spin	\$459
CD-Bundle 1	Encyclopedia, World Atlas & Factbook	\$89
CD-Bundle 2	Font Fun, Color it, Font Pro, Publish it	\$89
CD-Bundle 3	Animals, Game, Guinness, Sherlock	\$89
PM CDR	CD-ROM Recorder	\$3,499

Includes external drive, 25/50 SCSI Cable, Mac SW, Caddy, and Terminator

PRINTERS



MODEL	DESCRIPTION	PRICE
Dataproducts		
LZR-960	300dpi, 9ppm, RISC, 8.5x11	\$979
LZR-965	600dpi, 9ppm, RISC, 8.5x11	\$1,879
LZR-1560, 1 Tray	400dpi, 15ppm, RISC, 11x17	\$2,899
LZR-1580	400dpi, 15ppm, RISC, 11x17	CALL
NewGen 660B		
NewGen 1200	600dpi, 9ppm, RISC, 11x17	\$3,799
	1200dpi, 9ppm, RISC, 11x17	\$4,899

5.25" OPTICAL DRIVES



MODEL	CAPACITY	SEEK	MacKit
Sony-E502	594/650mb	66ms	\$2,049
Ricoh-9200EX	594/650mb	35ms	\$2,049
MaxOptix-Tahiti II	594/650/1gb	25ms	\$2,599
PLI Tahiti III	594/650/1.3GB		\$2,699
PMO-650	594/650mb	19*ms	\$2,699
HP1716T	594/650/1.3GB	25ms	\$2,689
PMO-1.3	594/650/1.3GB	25ms	\$2,999
MaxOptix-Tahiti III	1gb/Worm	25ms	\$3,389

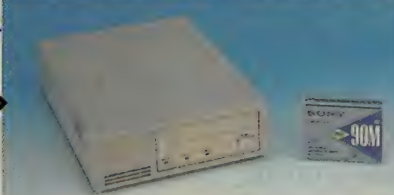
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MODEL	CAPACITY	SIZE	MacKit
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Archive Viper 525	500MB	3.5"HH	\$699
Sony SDT-2000	2Gbyte	3.5"HH	\$919
Sony SDT-5000	5-16Gbyte	3.5"HH	\$1,599
Archive Python	2Gbyte	3.5" HH	\$975
Archive Turbo	2-8 Gbyte	3.5" HH	\$1,199
HP 35470A	2Gbyte	3.5"HH	\$1,149
HP 35480A	3-5Gbyte	3.5"HH	\$1,265
Exabyte 8200	2Gbyte	5.25"FH	\$1,299
Exabyte 8500	5Gbyte	5.25"FH	\$2,199
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C 1.3 Gig 3.5"	\$1148	\$1248

Seagate Drives

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above: Nikon's CoolScan
right: The UMAX 840 & 630 scanners



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Mac Powerbook 165C 4/80	Call
Mac Powerbook 180	Call
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DRIVES

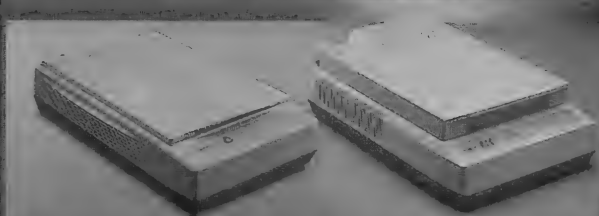
	Int.	Ext.
Quantum 127 MB	195	265
Quantum 240 LPS	295	375
Quantum 1 GB	1048	1109
Toshiba 1 GB	895	995
Toshiba 877 MB	775	865
Syquest 44 MB	395	
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APS Q 1050 (SR 2000 External)

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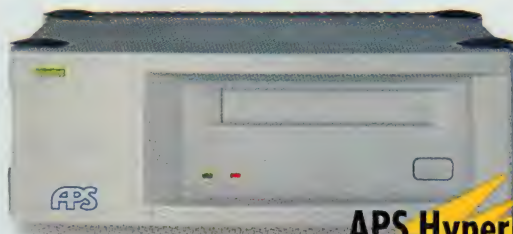


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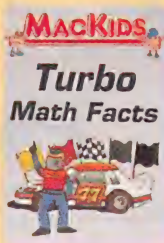
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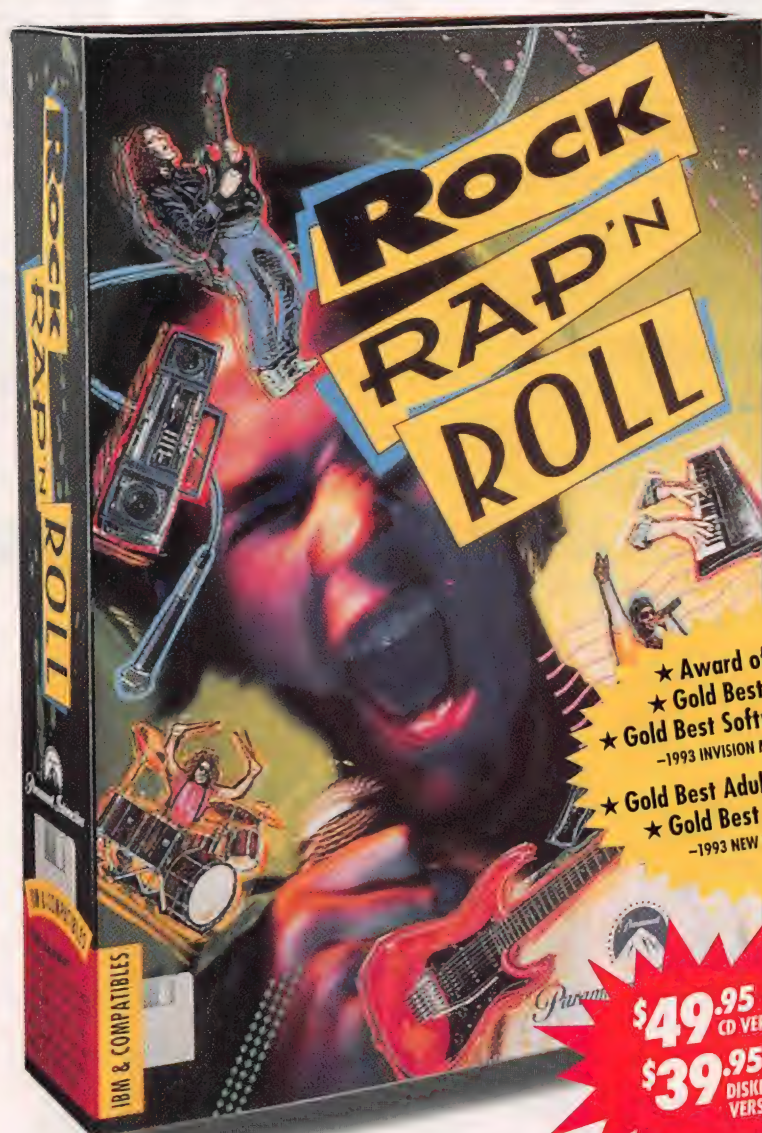
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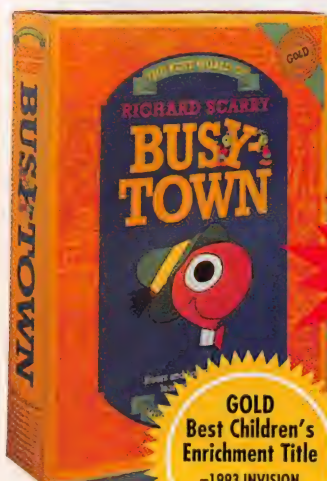
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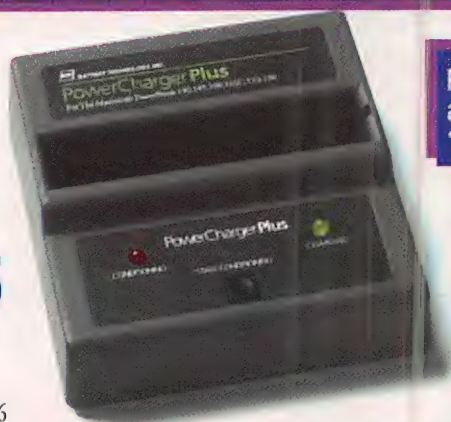
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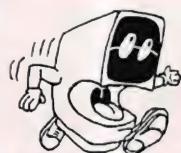
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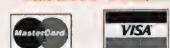
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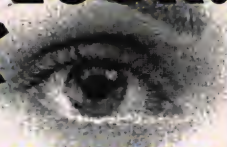
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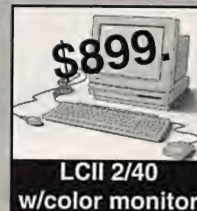


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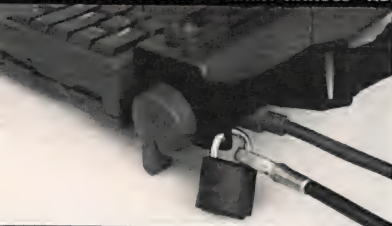
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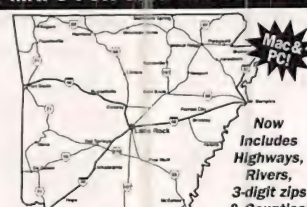
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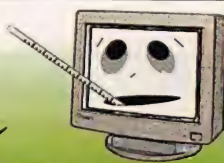
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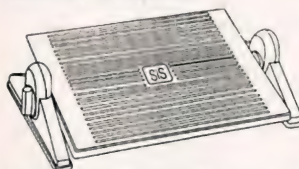
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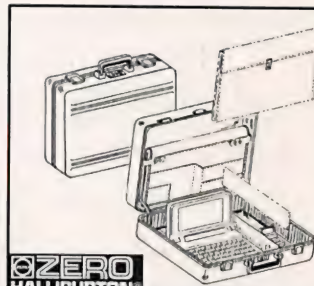
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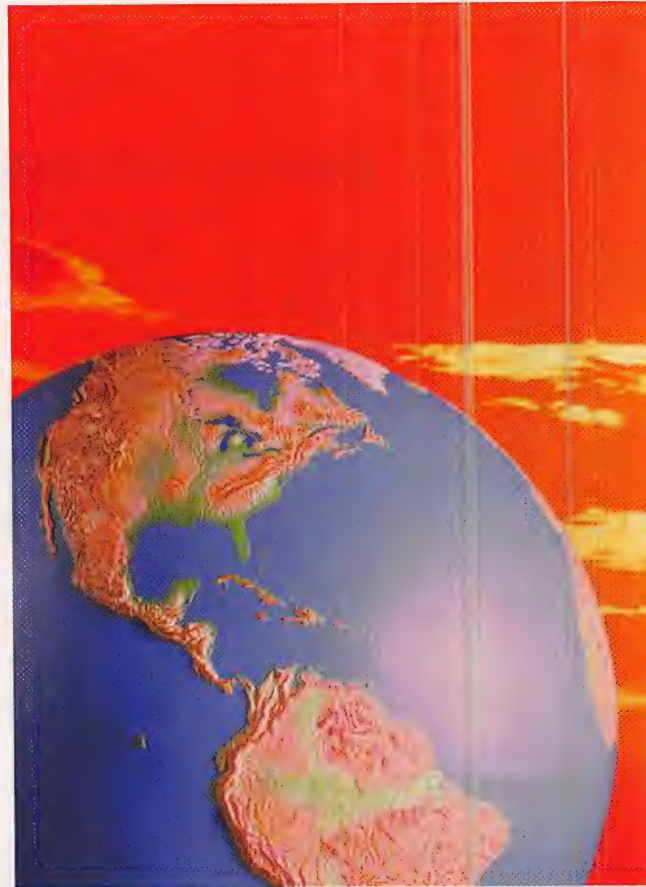
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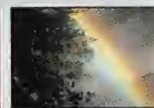
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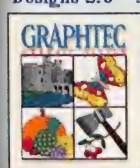
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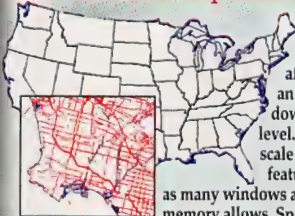
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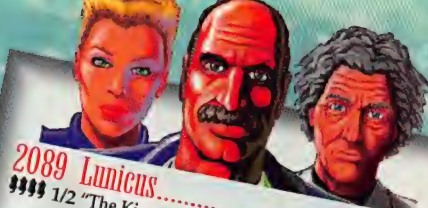
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WISE GUY

BY GUY KAWASAKI

Give—and You Might Receive

Christmas suggestions for the Mac industry

YOU CAN TELL A LOT ABOUT people by what they give for Christmas gifts. You can tell even more about people by what they should *get* for Christmas gifts. Here are some things to give this Christmas in order that we all might receive.

John Sculley, ex-CEO of Apple Bill and Hillary Clinton cardboard cutouts. We're going to see if the man made the position or the position made the man. Just in case Bill and Hillary aren't his best buddies now that he heads an unheard-of company, John may have to use cutouts to show he's connected.

The Apple board of directors An outside director who knows that the mouse ball goes on the bottom. Apple's board is beginning to make the Bush administration look diverse. Aren't boards of directors supposed to keep the management in line, not *be* the management? How many liquor stores are run by alcoholics?

Bill Gates, chairman, Microsoft The first copy of Nolo Press's new product, Nolo's Prenuptials. (Nolo Press is the developer of products such as Will-Maker and Nolo's Living Trust.) There are 7 billion reasons why Bill needs this gift. Given the size of his estate, the prenuptial agreement may need to be on a CD-ROM, so you might want to send him a CD-ROM drive too.

Fred Ebrahimi, CEO, Quark An \$895 Nordstrom gift certificate. Fred should see the kind of service some companies give their customers for \$895. If you give this gift to Fred, maybe he'll make a New Year's resolution that will be good news for QuarkXPress owners.

Laid-off Apple employees A copy of *What Color Is Your Parachute?*, by Richard Bolles. This book is guaranteed to help them in their search for a new job or career. There is life after Apple. In fact, some folks say that the only thing better than working at Apple is leaving Apple.

May they all come to ask themselves, "Why did I stay so long?" and live happily ever after.

Macintosh LC II and IIx owners A one-year subscription to *MacWeek*, so they can read the rumors about new Macintoshes. They might be able to avoid buying a model immediately before it becomes outdated. Better yet, they could simply get on with life and not worry about it, because obsolescence is a fact of life in personal computers.

Macintosh novices A copy of *Jargon*, by Robin Williams. *Jargon* is a computer dictionary that provides definitions everyone can understand. My favorite is "tits on a keyboard. Don't yell at me—I didn't make this up. Tits on a keyboard are those

hour, full-contact massage by Akebono, sumo champion of Japan. Crichton rubbed many Japanese people the wrong way by depicting the Japanese in unflattering ways in *Rising Sun* and *Congo*, so why not return the favor?

Mike Spindler, CEO, Apple Computer The *next* Macintosh. I don't mean a new model of *this* Macintosh. I mean a computer that leapfrogs Macintosh the way Macintosh leapfrogged the Apple II. At least Steve Jobs left John Sculley something besides disgruntled employees.

Global Village Communication A pair of boxer shorts (or a new ad agency). Although I am a shareholder of Global Village, I think its ad showing a guy's naked butt is dumb. The concept works for Timberland because it sells clothes and shoes, but Macintosh owners want ads that inform rather than insult. No butts about it.

Newton owners One free copy of Mavis Beacon Teaches Penmanship. Why do they need a copy of this software? To help new town finger out what wear tying do wrath.

Electronic Arts, publisher of Mavis Beacon Teaches Typing Electronic Arts got its Christmas gift early: the first version of Newton. Now all the company has to do is capitalize on it by creating a new version of their typing tutor that teaches penmanship to Newton users.

Steve Capps, engineering honcho of the Newton project Two years of patience. He and the rest of the Newton team have been taking some heat. For Newton, this is 1984 and Newton is the Macintosh 128K. Criticize Newton all you like, but watch what it is in two years. People laughed at Macintosh too. **m**



little bumps on the letters on the keyboard that let you know if your fingers are in the right place without having to look."

Macintosh old-timers A copy of *Hard Drive*, by David Pogue. What could be better than a novel about Macintosh when they're tired of reading *Inside Macintosh, Volume XX*? It has an arrogant Macintosh programmer, a Silly-con Valley start-up, a beautiful product manager, and a terrifying virus. Old-timers will know that *Hard Drive* is fiction because it's about voice recognition that works.

Michael Crichton, author and Macintosh user A gift certificate for a one-

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. His current book, *Hindsights*, will be published by Beyond Words Publishing in January. He has investments in Bit Jugglers, Global Village Communication, Book-maker Corporation, and others. He can be reached at Kawasaki@radiomail.net.



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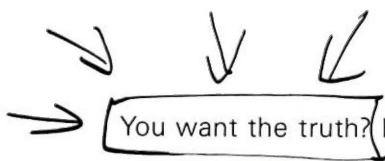
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with a long list of numbers and specs. But, what does it all mean?

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